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Under-reporting on the MMPI-2-RF extends to extra-test measures of suicide risk

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Abstract

Detection of under-reporting in suicide risk assessment remains a significant concern in clinical practice. The aim of this research is to examine whether under-reporting based on elevated MMPI-2-RF K-r and L-r scale scores may aid in identifying patients with suppressed scores on SUI and extra-test measures of suicide risk. We anticipated that, in voluntarily admitted psychiatric inpatients ($N=1,011$) and individuals receiving outpatient services in a university-affiliated psychology clinic ($N=521$), those indicated as under-reporting would produce lower mean scores across SUI and extra-test measures of suicide risk, and that the magnitudes of the associations between SUI and extra-test scores would be strongest for those underreporting. A series of t -tests and correlational analyses were conducted in both samples. While those classified as under-reporting consistently produced lower mean scores for SUI and extra-test measures of suicide risk, the magnitudes of the associations were consistently significant and stronger only in outpatients without K-r or L-r scale elevations. Clinical implications for this research include examining K-r elevations when assessing suicide risk and incorporating a therapeutic assessment approach to suicide risk assessment.

Keywords

suicide risk; MMPI-2-RF; under-reporting; inpatients; outpatients

High risk populations have been observed to underreport or minimize suicide risk in order to avoid hospitalization or decrease time hospitalized (Oquendo & Bernanke, 2017; Petrik et al., 2015). Suicide risk assessment procedures would benefit from including methods

of identifying under-reporting (UR), which may result in suppressed scores on self-report measures of suicide risk. The Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF; Ben-Porath & Tellegen, 2008/2011) includes an indicator of suicide risk [Suicide/Death Ideation scale (SUI)] and multiple response bias indicators (see Sellbom, 2019), making it well-suited to accomplish this aim. The current study was designed to examine whether UR detected by the MMPI-2-RF is associated with lower scores for SUI and extra-test suicide risk measures.

MMPI-2-RF Uncommon Virtues (L-r) and Adjustment Validity (K-r) indicators of UR were developed using factor analysis on items from MMPI-2 Lie (L), Correction (K), and Superlative Self-Presentation (S) scales and the Wiggins Social Desirability scale in various samples (Tellegen & Ben Porath, 2008/2011). Elevated K-r scores are indicative of individuals presenting as more well-adjusted than the average respondent, while elevated L-r scores are indicative of individuals presenting as more virtuous than the average respondent. K-r and L-r elevations have been observed to occur in high stakes contexts including employment screenings (Detrick & Chibnall, 2014) and child custody evaluations (Archer et al., 2012). K-r and L-r scale scores have been shown to differentiate between psychiatric patients and undergraduates who completed the MMPI-2-RF under standard instructions and those in a simulated UR group (Crighton et al., 2017; Sellbom & Bagby, 2008). Additionally, suppression effects were observed across multiple scales for undergraduates, male prisoners, and Veterans Affairs psychiatric outpatients classified as UR based on L-r and/or K-r, relative to those who were not (Forbey et al., 2013), and those who adopted an UR response style on the MMPI-2-RF endorsed greater adaptive functioning and less psychopathology on extra-test measures relative to those who did not (Forbey et al., 2013). Despite indications that elevated L-r and K-r scores may be indicative of suppressed scores in certain clinical contexts, limited research has focused on examining this phenomenon in the context of suicide risk assessment. In a Veterans Affairs setting, those who produce lower MMPI-2-RF K-r and L-r scores endorsed a lower frequency of past-week suicidal ideation (Khazem et al., 2021). Given these preliminary findings, further research is needed to examine whether MMPI-2-RF-based UR is associated with suppressed scores in other settings.

The MMPI-2-RF SUI scale has demonstrated strong associations with other self-report measures of suicide risk and is predictive of future suicidal behaviors (Glassmire et al., 2015; Tarescavage et al., 2018). UR may result in suppressed SUI scores. Forbey et al. (2013) did not observe significant mean differences in SUI between non-UR and UR, yet effect sizes ranged from small to large (i.e., $d = -0.26 - -0.93$). Additionally, individuals who denied suicidal ideation and behaviors on the MMPI-2 and a clinical interview produced significantly higher K and S scores than those who endorsed suicide-related items on the MMPI-2 only (Glassmire et al., 2001). Although it is yet to be empirically tested, individuals may attempt to present themselves as more well-adjusted (reflected by K-r elevations) or more virtuous or likable (reflected by L-r) in order to continue treatment at the outpatient level and avoid referrals for higher levels of care or, for those in inpatient settings, to distinguish themselves from others receiving treatment in order to hasten discharge. Across both settings, these individuals may also produce lower SUI scale

scores and similarly suppressed scores on extra-test measures of suicide risk due to face validity of these instruments in order to avoid detection.

In this research, we tested whether UR, measured by K-r and L-r elevations, results in suppression of SUI scores and those of extra-test suicide risk measures across settings (psychiatric inpatient and outpatient psychology clinic). In both settings, we first tested for whether mean differences in SUI and extra-test suicide risk scores exist based on UR (i.e., K-r and L-r examined together and separately), followed by testing the strength of the association between SUI and extra-test suicide risk measures between groups to assess the consistency of UR across measures. We anticipated that, in both settings, those indicated as UR would produce lower mean scores across methods of suicide risk assessment, with associations between these measures strongest among those classified as UR. Findings in line with these hypotheses would provide support for the clinical utility of the MMPI-2-RF in identifying suppressed suicide risk scores, which may result in under-identification of suicide risk, regardless of the severity of psychiatric symptoms or setting of administration. Identifying these individuals would indicate the need for targeted clinical efforts to address both the reduction of suicide risk and reasons for UR (e.g., addressing concerns about hospitalization, impression management).

Method

Participants and procedures

Sample 1—The full psychiatric inpatient sample included 1,074 individuals voluntarily admitted to a private psychiatric hospital. The MMPI-2 was administered for clinical use by a psychologist, if deemed appropriate by the treatment team, while the Columbia Suicide Severity Rating Scale (CC-SSRS; Posner et al., 2011) was administered for research purposes. Respondents were informed that their treatment team would have access to responses from both measures, administered roughly 12 days apart from each other. All study procedures were approved by the affiliated medical center's IRB. Standard procedures for identifying invalid MMPI-2-RF protocols were used (CNS ≥ 15 , VRIN-r $\geq 80T$, TRIN-r $\geq 80T$, F-r $\geq 120T$, and Fp-r $\geq 100T$; e.g., Ben-Porath & Tellegen, 2008/2011), and 64 (6.0%) invalid protocols were removed from all analyses, resulting in a final sample of 1,010 psychiatric inpatients. Excluded and included participants did not differ by age [$t(1072) = .91, p = .364$] or marital status [$\chi^2(5) = 2.12, p = .819$], but did differ by ethnicity [$\chi^2(5) = 11.41, p = .044$] and gender [$\chi^2(1) = 12.62, p < .001$]. Females were more likely to produce an invalid protocol than males, and patients who identified as White were more likely to have valid profiles [$\chi^2(1) = 7.40, p = .007$]. Patients who identified as Multiracial were more likely to have invalid profiles [$\chi^2(1) = 8.01, p = .005$]. See Supplemental Table 1 for demographics of the final sample.

Data regarding the reasons for admission were not available. Patients often receive comorbid diagnoses in this setting, with the most prevalent being major depressive disorder, recurrent (43.5%); substance dependence (30.5%); and anxiety disorder not otherwise specified (26.6%). The number of reported admissions for previous acute psychiatric hospital care ranged from zero to 50 ($M = 1.16, SD = 2.60$). The number of reported admissions for

previous extended psychiatric hospital care ranged from zero to 20 ($M = 0.87$, $SD = 1.72$). The average length of stay for the present sample was 46.23 days ($SD = 18.34$).

Participants were categorized into UR or non-UR based on L-r and K-r ($L-r > 69T$ or $K-r > 65T$). Fifty-seven (5.6%) participants were classified as UR based on elevated scores on either scale and did not differ from those classified as non-UR by marital status [$\chi^2(5) = 1.19$, $p = .946$], gender [$\chi^2(1) = 0.69$, $p = .408$], or age [$t(1008) = -1.31$, $p = .194$]. There was a significant association between race/ethnicity and UR [$\chi^2(5) = 24.55$, $p < .001$]. Patients who identified as Asian and Multiracial were more likely to be in the UR group, while patients identifying as White were more likely to be in the non-UR group. Finally, there was a significant association between suicide attempt history and UR [$\chi^2(2) = 8.64$, $p = .013$]; participants with multiple attempts were more likely to be classified as non-UR [$\chi^2(1) = 6.10$, $p = .013$], and patients with no attempts were more likely to be classified as UR [$\chi^2(1) = 7.96$, $p = .005$].

Sample 2—The full outpatient sample consisted of 572 individuals presenting at a university-based psychology clinic, with the majority of patients being non-student members of the local community. The clinic's exclusionary criteria are limited to: (1) *imminent* risk of harm to self or others and/or (2) suffering from a psychotic spectrum or bipolar disorder that is not managed by medication. Patients receive services from doctoral-level student clinicians, and patients complete a battery of self-report questionnaires for clinical purposes during the intake process, including the Beck Scale for Suicide Ideation (Beck & Steer 1991) and MMPI-2. Patients provide informed consent prior to completing the questionnaires which includes the option to decline having their responses to measures included in a database for research purposes. All procedures were approved by the university's IRB.

Individuals who produced invalid MMPI-2-RF profiles using the criteria described in Sample 1 ($n = 51$; 8.9%) were excluded from analyses, leaving a final sample of 521 participants. Excluded and included participants did not differ by age [$t(57.60) = -1.47$, $p = .148$] or gender [$\chi^2(1) = .41$, $p = .524$] but did differ by race/ethnicity [$\chi^2(5) = 15.17$, $p = .010$] and marital status [$\chi^2(4) = 11.57$, $p = .021$]. Significantly more American Indian/Alaskan Native participants produced invalid profiles than valid, and a significantly higher proportion of married and widowed participants produced valid profiles than invalid. See Supplemental Table 1 for demographics of the final sample.

Sixty-eight participants (13.1%) were classified as UR using the criteria outlined above and did not differ from the non-UR group by age [$t(519) = 0.37$, $p = .713$], race/ethnicity [$\chi^2(5) = 5.06$, $p = .409$], or marital status [$\chi^2(4) = 5.38$, $p = .250$]. However, those in the UR group were more likely than those in the non-UR group to identify as male [$\chi^2(1) = 4.31$, $p = .038$] and less likely to report a history of suicide attempt [$\chi^2(1) = 4.43$, $p = .035$].

Measures

Samples 1 and 2

MMPI-2-RF (Ben-Porath & Tellegen, 2008/2011).: Participants completed the MMPI-2, which was recalculated to reflect the MMPI-2-RF. Previous studies have demonstrated the validity of this approach (Ben-Porath & Tellegen, 2008; Tarescavage et al., 2014; Van Der Heijden et al., 2010). MMPI-2-RF L-r, K-r, and SUI scales were used in the current study. In Sample 1, internal consistency for L-r and K-r were commensurate with those of psychiatric inpatient samples reported in the MMPI-2-RF technical manual (Tellegen & Ben-Porath, 2008/2011; $\alpha = .52$ and $.69$, respectively). SUI demonstrated acceptable internal consistency ($\alpha = .75$ for non-UR and $\alpha = .72$ for UR groups), consistent with comparison samples of psychiatric inpatient of men ($\alpha = .80$) and women ($\alpha = .81$; Tellegen & Ben-Porath, 2008/2011). In Sample 2, internal consistencies for L-r and K-r were also commensurate with those of the outpatient community mental health sample included in the MMPI-2-RF technical manual ($\alpha = .72$ and $.55$, respectively; Tellegen & Ben-Porath, 2008/2011), while that of SUI ($\alpha = .59$ for non-UR and $\alpha = .33$ for UR groups) was lower than anticipated, given values reported for men ($\alpha = .78$) and women ($\alpha = .76$) in the outpatient comparison sample (Tellegen & Ben-Porath, 2008/2011).

Sample 1 only

Columbia Suicide Severity Rating Scale (C-SSRS; Posner et al., 2011).: The C-SSRS is a structured clinical interview that assesses suicide ideation severity and intensity and suicidal behavior. It was administered for research purposes by trained research personnel. The Ideation Intensity subscale was used to assess current suicidal ideation intensity. Responses to questions about the intensity of current suicide ideation are coded and summed to calculate a total score, with higher scores representing greater intensity.

Sample 2 only

Beck Scale for Suicide Ideation (BSS; Beck & Steer, 1991).: The first 19 items were summed as a measure of suicidal ideation¹. The BSS was administered by non-licensed clinic staff or licensed-exempt doctoral students to all outpatients for both research and clinical purposes. The internal consistency of these items was excellent ($\alpha = .93$ for non-UR and $\alpha = .92$ for UR groups).

Data Analytic Strategy.

T-tests were conducted in both samples to examine whether UR and non-UR groups (as well as K-r or L-r alone) differed in mean scores of self-reported suicidal ideation on the MMPI-2-RF SUI scale, C-SSRS (Sample 1), and BSS (Sample 2). Fisher *r*-to-*z* transformation was used to examine the magnitudes of correlations between the MMPI-2-RF SUI and extra-test measures of suicide risk between UR and non-UR groups and between those with elevated and non-elevated K-r and L-r scores in each sample. Missing data in Samples 1 and 2 (0.7% and 0.2%, respectively) were handled via listwise deletion. Effect

¹The final two items of the BSS assess the number of previous suicide attempts and intent to die during these attempts and were not included in the analyses.

sizes are interpreted based on recommendations by Cohen (1988, 1992): small ($r = .10-.29$; $d = .20-.49$), medium ($r = .30-.49$; $d = .50-.79$), and large ($r = .50$ and above; $d = .80$ and above).

Results

Sample 1 (Psychiatric Inpatient)

There were significant (all $p < .001$), small-sized differences between groups for MMPI-2-RF SUI ($d = .49$) and medium-sized differences for C-SSRS ideation intensity ($d = .52$); for both measures, the UR group produced significantly lower mean scores than the non-UR group. In correlation analyses, large-sized effects were observed for both groups, but C-SSRS scores were more strongly correlated with SUI among the UR group ($r = .73$, $p < .001$, 95% CI: $.61-.84$) than the non-UR group ($r = .60$, $p < .001$, 95% CI: $.56-.64$). The magnitudes in correlations between SUI and the C-SSRS significantly differed across groups ($z = 1.71$, $p < .04$).

When examining UR indexed by K-r, there were significant (all $p < .001$), large-sized mean differences between groups for both MMPI-2-RF SUI ($d = .83$) and C-SSRS ideation intensity ($d = .85$). Those with elevated K-r scores produced significantly lower mean SUI and C-SSRS ideation intensity scores than those without elevated scores. Large-sized correlations between SUI and C-SSRS scores were observed between those with and without elevated K-r scores, with scores more strongly associated among those with elevated K-r scores ($r = .68$, $p < .001$, 95% CI = $.42-.89$) than among those without elevated K-r scores ($r = .60$, $p < .001$, 95% CI = $.56-.64$). The magnitudes in correlation across K-r were not significantly different ($z = 0.74$, $p = .229$).

When examining L-r, there were significant (all $p < .05$), small-sized differences between groups for both MMPI-2-RF SUI ($d = .34$) and C-SSRS ideation intensity ($d = .36$). Those with elevated L-r scores produced significantly lower mean SUI and C-SSRS ideation intensity scores than those without L-r elevations. Large-sized correlations between SUI and C-SSRS ideation intensity scores were observed between those with and without elevated L-r scores, with SUI and C-SSRS ideation intensity scores more strongly associated among those with elevated L-r ($r = .71$, $p < .001$, 95% CI = $.55-.85$) than among those without ($r = .61$, $p < .001$, 95% CI = $.56-.65$). The magnitudes in correlation across L-r were not significantly different ($z = 1.04$, $p = .15$). See Supplemental Table 2 for results of t -tests and Supplemental Figure 1 for graphical representations of the correlations and ranges of scores between groups.

Sample 2 (Outpatient)

There were significant (all $p < .001$), small-sized differences between groups on SUI ($d = .48$) and significant, medium-sized differences in BSS scores ($d = .59$). For both measures, those classified as UR produced significantly lower mean scores than the non-UR group. SUI and BSS scores were more strongly associated among the non-UR group with a medium-sized effect ($r = .46$, $p < .001$, 95% CI = $.38-.53$) than among the UR group ($r = -.01$, $p = .946$, 95% CI = $-.25-.23$). The magnitudes in correlation between the MMPI-2-RF SUI and BSS differed largely across groups ($z = 3.82$, $p < .001$).

When examining K-r, there were significant (all $p < .05$), small-sized differences between groups for SUI ($d = .39$) and medium-sized differences for the BSS ($d = .68$). For both measures, those with elevated K-r scores produced significantly lower mean scores than those without elevated scores. SUI and BSS scores were more strongly associated among those without elevated K-r scores ($r = .45$, $p < .001$, 95% CI = .38 – .52) than among those with elevated scores ($r = -.27$, $p = .162$, 95% CI = -.65 – .21), and the magnitudes in correlation differed largely across K-r ($z = 3.77$, $p = .001$)

When examining L-r, there were significant, medium-sized differences between groups for SUI ($d = .56$) and small-sized differences for the BSS ($d = .49$). For both measures, those with elevated L-r scores produced significantly lower mean scores than those without. SUI and BSS scores were more strongly associated among those without elevated L-r scores ($r = .45$, $p < .001$, 95% CI = .38 – .52) than among those with elevated scores ($r = .05$, $p = .720$, 95% CI = -.24 to .34), and the magnitudes in correlation differed largely across groups ($z = 2.71$, $p = .01$).² See Supplemental Table 2 for full results of t -tests and Supplemental Figure 2 for graphical representations of the correlations and ranges of scores between groups.

Discussion

We assessed whether elevated K-r and L-r scales exhibit a suppressing effect on the relationship between SUI and extra-test scores of suicide risk in inpatient and outpatient samples. We anticipated that UR groups (based on elevations on either K-r or L-r), and those producing elevated K-r and L-r scores examined independently of one another, would produce lower mean scores across all measures, and associations between these measures would be strongest among those identified in all iterations of UR. Results partially supported our hypotheses.

As expected, the UR group endorsed lower scores across measures of suicide risk than those classified as non-UR in both samples; effect sizes were larger for extra-test suicide risk measures than SUI, supporting previous assertions that SUI may be slightly less impacted by UR than other suicide risk measures (Khazem et al., 2021). While SUI and C-SSRS were more strongly correlated in UR inpatients, SUI and BSS scores were more strongly correlated for *non*-UR outpatients, contrary to expectations. Similar findings regarding mean differences were observed when K-r- and L-r-based UR were examined in both groups; however, the magnitudes in correlations no longer differed between the UR and non-UR groups in psychiatric inpatients when these scales were examined individually. Range restriction of SUI and extra-test scores (see Supplemental Figures 1 and 2), particularly based for those K-r elevations, was observed across samples, supporting our hypothesis regarding the motives behind K-r elevations. We initially posited that individuals in inpatient and outpatient settings may have unique motivations to present themselves as more well-

²Analyses were repeated including MMPI-2-RF profiles with $F-r \geq 120T$, and $Fp-r \geq 100T$. In Sample 1, the results of t -tests were consistent with those reported above, with the exception of no statistical significance observed for t -tests examining mean differences in outcomes between those with and without elevated L-r scores. The magnitude in correlation between SUI and C-SRRS scores was no longer significant between those identified as UR on either or both K-r or L-r. In Sample 2, the results of all analyses were consistent with those reported above. However, the correlation between SUI and BSS scores was only significant for those without K-r elevations, resulting in a larger magnitude in correlation between groups ($z = 4.05$, $p < .001$). We have elected to exclude these results from the main text in accordance with standard interpretation procedures (Ben-Porath & Tellegen, 2008/2011).

adjusted (elevated K-r) or virtuous (elevated L-r) than most people. Clinicians in both settings may consider noting K-r elevations in the context of reticence in disclosing suicidal ideation, while those with L-r elevations may be more inclined to disclose these thoughts.³ While these validity scales are often both elevated, there may be some circumstances in which they are not (Graham, 2006); differences in treatment setting may account for divergent results.

In outpatient settings, individuals may be concerned that disclosing suicidal ideation or intent may result in hospitalization or increased treatment. However, current findings raise the possibility that those voluntarily hospitalized in private psychiatric inpatient facilities may be more motivated to disclose distress in order to quickly receive care and be discharged from treatment. These findings are partially consistent with prior research finding those who are UR also produce lower mean scores on conjointly administered self-report measures (Forbey et al., 2013), which may generalize to interview-based assessments in inpatient settings or those administered for research purposes. We note, however, that psychiatric inpatients were made aware that their treatment team would have access to their C-SSRS scores. Additionally, the results of the current study indicate that when K-r and L-r elevations are examined as separate indicators of UR, results may not generalize in the same manner. We also note that the C-SSRS was administered to inpatients for research purposes, whereas the BSS was administered to outpatients for clinical purposes. Given the tendency for UR to be dependent on the purpose of testing (Archer et al., 2012; Detrick & Chibnall, 2014), and that the BSS was interpreted by clinicians to guide treatment, testing context may have impacted results.

This research underscores the necessity of identifying those who are indicated as UR, particularly within the context of K-r elevations, and points towards the advantages of including both objective assessment and clinical interview in suicide risk assessment. Inpatients with L-r elevations and K-r elevations demonstrated a tendency to produce a restricted range of both SUI and C-SSRS scores; however, the range of C-SSRS scores was less impacted by range restriction than SUI. This observation points to the possibility that incorporating clinical interview in multimodal suicide risk assessments, particularly when impression management is suspected, may provide further opportunities to detect suicide risk. Indeed, once UR is identified, further assessment is indicated to ascertain whether a lack of endorsing suicide risk is truly indicative of low risk or if further clinical intervention is needed. In line with a collaborative assessment approach, effective clinical interview and discussion about the purposes, procedures, and potential outcomes of suicide risk assessments can serve to increase therapeutic alliance before the assessment is completed (Bryan & Rudd, 2006; Jobes, 2016). After UR has been indicated, providing the opportunity to retake the MMPI-2-RF, advised for most clinical purposes excluding assessments for legal or employment purposes, may be fruitful, as this approach has resulted in credible responding to the MMPI instruments in the majority of cases (Butcher et al., 1997; Cigrang & Staal, 2001). Future research may examine whether employing therapeutic assessment,

³We were unable to extend our analyses to examining self-reported suicide attempts in both samples as all individuals producing L-r elevations denied a history of suicide attempts. Future research may examine whether self-report suicide attempt history is similarly associated with UR.

including incorporating both objective assessment and clinical interviews, may decrease UR and its impact in suicide risk assessment.

The current findings also contribute to the conversation regarding the clinical utility of response bias indicators. Although some have questioned the necessity of assessing response bias (McGrath et al., 2010), continuing research has noted that an individual's approach to assessment gleans important clinical information, including future engagement in treatment (Anestis et al., 2015). Additionally, those who intentionally decline to respond to measures of suicide risk have been indicated as being at similar risk of suicide as those endorsing current suicide ideation (Podlogar & Joiner, 2020). Indeed, Glassmire et al. (2015) observed that many individuals who deny suicide ideation during clinical interviews will endorse at least one SUI item, indicating that examining individual MMPI items may provide valuable clinical information about the nature of suicide risk when UR is suspected. Although prior work has not extended the assessment of MMPI-2-RF response bias to identifying those at risk of suicide, the present study indicates that a UR approach to testing may impact within-test and extra-test measures of suicidality. Such findings support the assessment of response bias in suicide risk assessment. However, we note that including non-self-report criteria of response bias are preferred to the self-report methods employed in this research. Self-report criteria are often influenced by invalid responding in the same manner as the measure being studied (Forbey & Lee, 2011). Employing a simulation design for MMPI-based research focused on UR and suicide risk that includes other indicators of risk (e.g., medical record review), is a next step in this line of research.

It is important to note that the current study findings are likely applicable to the newly published MMPI-3 (Ben-Porath, 2020a), which features revised content and modernized norms. MMPI-2-RF L-r and K-r scales are deemed interchangeable with their MMPI-3 counterparts (r s of .98 and .93, respectively). Likewise, although SUI underwent revision during MMPI-3 development, intercorrelations between MMPI-2-RF and MMPI-3 SUI and comparable associations of MMPI-2-RF & MMPI-3 SUI with external correlates all suggest equivalence across instruments (Ben-Porath & Tellegen, 2020b). Although future research is needed to confirm this, it seems apparent that current study findings can be extended to the MMPI-3.

Due to the nature of the psychiatric hospitalization program and severity of the sample in Study 1, participants were administered the C-SSRS and MMPI-2-RF roughly 12 days from each other, and descriptive statistics to ascertain differences in suicide risk during this period were not collected. Additionally, reasons for admission to the program were not available. It is possible that motivations to under- or over-report among those voluntarily receiving inpatient treatment may be impacted by reasons for admission or may have changed within the administration period as patients may have experienced a greater desire for a hastened discharge at either time point. Similar limitations regarding the timing of testing are noted for Study 2. Additionally, the internal consistency of SUI in Sample 2 was also lower than anticipated, which may impact interpretation of the findings. Despite these limitations, this research provides support for the clinical utility of the MMPI-2-RF in identifying UR in suicide risk assessment and underscores the need for accurate identification of individuals at risk of suicide in clinical settings. This research is the first to examine the impact of

MMPI-2-RF-based UR, particularly in regard to prediction bias, on detecting suicide risk. Future research may focus on extending these findings in other samples and settings (e.g., forensic settings, state hospitals, Veterans Affairs), and using more objective indicators of suicide risk (e.g., confirmation of recent suicide attempts in medical records). Lastly, future research may consider whether findings differ based on the purposes of testing (e.g., treatment planning versus research).

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

- Anestis JC, Finn JA, Gottfried E, Arbisi PA, & Joiner TE (2015). Reading the road signs: The utility of the MMPI-2 Restructured Form Validity Scales in prediction of premature termination. *Assessment*, 22, 279–288. doi: 10.1177/1073191114541672 [PubMed: 25013122]
- Archer RP, Buffington-Vollum JK, Stredny RV, & Handel RW (2006). A survey of psychological tests use patterns among forensic psychologists. *Journal of Personality Assessment*, 87, 85–95. doi: 10.1207/s15327752jpa8701_07
- Archer EM, Hagan LD, Mason J, Handel R, & Archer RP (2012). MMPI-2-RF characteristics of custody evaluation litigants. *Assessment*, 19(1), 14–20. doi: 10.1177/1073191110397469 [PubMed: 21288990]
- Beck AT, & Steer RA (1991). *Manual for the Beck Scale for Suicide Ideation*. San Antonio: Psychological Corporation.
- Beck AT, Steer RA, & Ranieri WF (1988). Scale for suicide ideation: Psychometric properties of a self-report version. *Journal of Clinical Psychology*, 44(4), 499–505. doi: 10.1177/1073191110397469 [PubMed: 3170753]
- Ben-Porath YS, & Tellegen A (2020a). *MMPI-3: Manual for administration, scoring and interpretation*. University of Minnesota Press.
- Ben-Porath YS, & Tellegen A (2020b). *MMPI-3: Technical manual*. University of Minnesota Press.
- Ben-Porath YS, & Tellegen A (2008). *MMPI-2-RF: Manual for administration, scoring and interpretation*. University of Minnesota Press.
- Bryan CJ, & Rudd MD (2006). Advances in the assessment of suicide risk. *Journal of Clinical Psychology*, 62(2), 185–200. doi: 10.1002/jclp.20222 [PubMed: 16342288]
- Butcher JN, Morfitt RC, Rouse SV, & Holden RR (1997). Reducing MMPI-2 defensiveness: The effect of specialized instructions on retest validity in a job applicant sample. *Journal of Personality Assessment*, 68(2), 385–401. doi: 10.1207/s15327752jpa6802_9 [PubMed: 16370784]
- Cigrang JA, & Staal MA (2001). Readministration of the MMPI-2 following defensive invalidation in a military job applicant sample. *Journal of Personality Assessment*, 76(3), 472–481. doi: 10.1207/S15327752JPA7603_08 [PubMed: 11499459]
- Crighton AH, Marek RJ, Dragon WR, & Ben-Porath YS (2017). Utility of the MMPI-2-RF validity scales in the detection of simulated under-reporting: Implications of incorporating a manipulation check. *Assessment*, 24, 853–864. doi: 10.1177/1073191115627011 [PubMed: 26851055]

- Detrick P, & Chibnall JT (2014). Underreporting on the MMPI-2-RF in a high-demand police officer selection context: An illustration. *Psychological assessment*, 26(3), 1044–1049. doi: 10.1037/pas0000013 [PubMed: 24978133]
- Finn SE, & Tonsager ME (1997). Information-gathering and therapeutic models of assessment: Complementary paradigms. *Psychological assessment*, 9(4), 374–385. 10.1037/1040-3590.9.4.374
- Forbey JD, Lee TT, Ben-Porath YS, Arbisi PA, & Gartland D (2013). Associations between MMPI-2-RF validity scale scores and extra-test measures of personality and psychopathology. *Assessment*, 20(4), 448–461. doi: 10.1177/1073191113478154 [PubMed: 23443819]
- Glassmire DM, Stolberg RA, Greene RL, & Bongar B (2001). The utility of MMPI-2 suicide items for assessing suicidal potential: Development of a suicidal potential scale. *Assessment*, 8(3), 281–290. doi: 10.1177/107319110100800304 [PubMed: 11575621]
- Glassmire DM, Tarescavage AM, Burchett D, Martinez J, & Gomez A (2016). Clinical utility of the MMPI-2-RF SUI items and scale in a forensic inpatient setting: Association with interview self-report and future suicidal behaviors. *Psychological assessment*, 28, 1502–1509. doi: 10.1037/pas0000220 [PubMed: 26653054]
- Gottfried E, Bodell L, Carbonell J, & Joiner T (2014). The clinical utility of the MMPI-2-RF Suicidal/Death Ideation Scale. *Psychological assessment*, 26(4), 1205. doi: 10.1037/pas0000017 [PubMed: 25068910]
- Graham JR (2006). *MMPI-2: Assessing personality and psychopathology* (4th ed.). Oxford University Press.
- Hathaway SR, & McKinley JC (1943). *The Minnesota Multiphasic Personality Inventory*. Minneapolis, MN: University of Minnesota Press.
- Jobes DA (2016). *Managing suicidal risk: A collaborative approach*. Guilford Publications.
- Khazem LR, Anestis JC, Erbes CR, Ferrier-Auerbach AG, Schumacher MM, & Arbisi PA (2021). Assessing the Clinical Utility of the MMPI-2-RF in Detecting Suicidal Ideation in a High Acuity, Partially-Hospitalized Veteran Sample. *Journal of personality assessment*, 103(1), 10–18. doi: 10.1080/00223891.2020.1739057 [PubMed: 32208938]
- McGrath RE, Mitchell M, Kim BH, & Hough L (2010). Evidence for response bias as a source of error variance in applied assessment. *Psychological Bulletin*, 136, 450–470. doi: 10.1037/a0019216 [PubMed: 20438146]
- Oquendo MA, & Bernanke JA (2017). Suicide risk assessment: tools and challenges. *World Psychiatry*, 16(1), 28. doi: 10.1002/wps.20396 [PubMed: 28127916]
- Petrik ML, Gutierrez PM, Berlin JS, & Saunders SM (2015). Barriers and facilitators of suicide risk assessment in emergency departments: a qualitative study of provider perspectives. *General Hospital Psychiatry*, 37(6), 581–586. doi: 10.1016/j.genhosppsy.2015.06.018 [PubMed: 26208868]
- Podlogar MC, & Joiner TE (2020). Allowing for nondisclosure in high suicide risk groups. *Assessment*, 27, 547–559. doi: 10.1177/1073191119845495 [PubMed: 31053035]
- Posner K, Brent D, Lucas C, Gould M, Stanley B, Brown G, ... & Mann J (2008). Columbia-suicide severity rating scale (C-SSRS). *The American Journal of Psychiatry*, 12, 11266–1277. doi: 10.1176/appi.ajp.2011.10111704
- Sellbom M (2019). The MMPI-2-Restructured Form (MMPI-2-RF): Assessment of personality and psychopathology in the twenty-first century. *Annual Review of Clinical Psychology*, 15, 149–177. doi: 10.1146/annurev-clinpsy-050718-095701
- Sellbom M, & Bagby RM (2008). Validity of the MMPI-2-RF (Restructured Form) L-r and K-r scales in detecting under-reporting in clinical and nonclinical samples. *Psychological Assessment*, 20, 370–376. doi: 10.1037/a0012952 [PubMed: 19086760]
- Tarescavage AM, Alosco ML, Ben-Porath YS, Wood A, & Luna-Jones L (2015). Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF) scores generated from the MMPI-2 and MMPI-2-RF test booklets: Internal structure comparability in a sample of criminal defendants. *Assessment*, 22(2), 188–197. doi: 10.1177/1073191114537347 [PubMed: 24934218]
- Tarescavage AM, Glassmire DM, & Burchett D (2018). Minnesota Multiphasic Personality Inventory-2-Restructured Form markers of future suicidal behavior in a forensic psychiatric hospital. *Psychological Assessment*, 30, 170–178. doi:10.1037/pas0000463 [PubMed: 28368171]

- Tellegen A, & Ben-Porath YS (2008/2011). Minnesota Multiphasic Personality Inventory–2 Restructured Form: Technical manual. Minneapolis: University of Minnesota Press
- Van Der Heijden PT, Egger JIM, & Derksen JJJ (2010). Comparability of Scores on the MMPI–2–RF Scales Generated With the MMPI–2 and MMPI–2–RF Booklets. *Journal of Personality Assessment*, 92(3), 254–259. doi: 10.1080/00223891003670208. [PubMed: 20408025]

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Public Significance Statement:

These results highlight the need for accurate identification of individuals at risk of suicide while considering the context in which suicide risk assessment takes place.

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