Accuracy of Level of Care Determination among Clinical Staff with AMSR Training:

Analysis of Inpatient Readmission within Ten Days of Placement to the Outpatient Care

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Summary

Assessing and Managing Suicide Risk (AMSR) was developed to provide health and behavioral health professionals training on appropriate risk formulation for individuals at risk of suicide. This study evaluated level of care decisions made by AMSR-trained clinical staff—specifically, recommendation decisions of outpatient or inpatient care.

We used two-plus years of de-identified clinical records from a single inpatient psychiatric facility. The clinical records (n = 560) were of adult patients who presented to the facility during a mental health crisis. The individuals were assessed for suicide risk and subsequently placed in outpatient care by the AMSR-trained clinical staff.

The following criterion was adopted for the evaluation: Patient readmission to inpatient care within 10 days of assessment and recommendation to outpatient care.

Our analyses suggest that the AMSR supports appropriate care recommendations for individuals at risk of suicide seeking psychiatric care. Only 2.5% of patients (14 out of 560 clinical cases) assessed by AMSR-trained staff were readmitted to inpatient within the 10-day period. We also found that being female presents a higher likelihood of readmission.

There are some limitations to this study. First, we did not have data on patient attendance rates to prescribed outpatient care. Second, we did not have access to data on staff background characteristics that may influence their decision-making process. Finally, we did not have access to a comparison group—for example, patients whose clinical staff did not have AMSR training, or the pretraining baseline data from the clinical staff. We recommend future studies address these data limitations.

Introduction

Timely identification and assessment of suicidal individuals is critical to reducing suicide attempts and deaths in health and behavioral health care settings. Although one out of seven individuals who die by suicide had recent contact with an inpatient behavioral health professional at least a year before their death (Ahmedani et al., 2014), many mental health professionals lack the training to competently assess suicidality among their patients (Schmitz et al., 2012).

To address the lack of training in appropriate risk formulation for suicide, Assessing and Managing Suicide Risk (AMSR) was developed[1] to teach health and behavioral health care providers and support staff to utilize the latest research-informed suicide risk formulation in their day-to-day clinical work while embracing culturally competent and collaborative approaches to care. While the first iterations of the training had only one version and included 24 core competencies in eight focus areas, the curriculum was substantially updated and expanded in 2016 by the Zero Suicide Institute (ZSI) at Education Development Center (EDC). There are now multiple versions to address risk formulation in different settings—for inpatient mental health, outpatient mental health, and substance use treatment settings. These each focus on five core competencies: (1) approaching your work, (2) understanding suicide, (3) gathering information, (4) formulating risk, and (5) planning and responding. This comprehensive approach recognizes that risk formulation is not only assessing suicide risk by gathering information about a client, but also relies on the clinician's understanding of suicide. This includes an understanding of population-specific risks, a provider's own risk tolerance or reactions to suicide, and the need to set a collaborative relationship with patients and their support groups to plan and respond to suicidal thoughts and behaviors.

What makes AMSR unique is its theoretical underpinnings, its prevention focus, and its culturally competent approach to assessing suicide risk. The AMSR approach, referred to as prevention-oriented suicide risk formulation, requires practitioners to assess (1) a patient's risk status, (2) their risk state, (3) available resources from which the patient can draw in crisis, and (4) foreseeable changes that may exacerbate risk (Pisani et al., 2016). *Risk status* refers to risk that is relative to others in the patient's population (i.e., chronic risk). Risk status characteristics are more enduring factors particular to a patient's population, such as strengths and protective factors, long-term risk factors, impulsivity and self-control, and past suicidal behavior. *Risk state* is the risk relative to the patient at baseline or at a selected time. Risk state often is affected by more dynamic factors, such as recent or present suicidal ideation, stressors, symptoms, recent

[1]AMSR was developed in 2004 by the SAMHSA-funded Suicide Prevention Resource Center housed at Education Development Center (EDC), using an expert clinician-researcher task force. The AMSR curricula have been managed by the Zero Suicide Institute at EDC since 2016 and—in response to the unique needs of inpatient, outpatient, and SUD settings—have been expanded from one general AMSR training to five setting-specific offerings.

changes, and engagement with others (i.e., acute risk). Risk status and risk state are considered alongside immediately available internal and social resources that can support a patient's safety and treatment planning, as well as an assessment of foreseeable changes in a patient's environment that could increase risk state. Contingency plans then can be made with the patient and support systems. Prevention-oriented suicide risk formulation challenges the status quo of prediction risk formulation. This is because predictive suicide risk formulation traditionally assesses a patient's risk as low, medium, or high without assessing the patient's risk relative to other patients in the same setting (e.g., a college counseling center or an inpatient psychiatric hospital) (Pisani et al., 2016).

The lack of suicide-specific training is pervasive to training programs for mental health professionals (Schmitz et al., 2012) despite suicide prevention education and training for staff being shown to improve attitudes and confidence around caring for suicidal individuals (Ramberg et al, 2016; Wakai et al., 2020). Mitchell et al. (2020) also found that suicide risk assessment training appeared to decrease mental health professionals' negative and anxious reactions toward suicidal individuals and enhance their self-reported confidence in suicide risk management.

AMSR had been evaluated twice prior to this study. The first reviewed pre- and post-training surveys from 668 trainings held by 121 organizations in the U.S. between March 2017 and November 2018. This evaluation found that the AMSR training increased confidence and competence in assessing and managing suicidal patients and that training participants showed statistically significant improvements in knowledge (Zero Suicide Institute, 2019). Participants had the most capacity/skill change gains from pre- test to post- test in their preparedness to write a straightforward and efficient risk assessment, synthesize information from the patient into a plan to manage their risk for suicide, and work collaboratively with a patient to develop a plan that outlines specific steps if they experience suicidal thoughts or triggers. These capacity and skill change findings also were sustained 3 months after the training. In the protocol and policy change areas, training participants reported the most pronounced changes in the need to review every "touchpoint" suicide risk, use a standard safety planning template that includes lethal means safety, and use a standard process for engaging a patient's family and others in planning in case the patient has a crisis in the future. Finally, in the practice change areas, training participants had the most pronounced changes in their practice in three areas: (1) applying a template or outline to guide writing a suicide risk formulation; (2) applying a standard set of practices to synthesize information into a plan to manage a patient's risk for suicide; and (3) identifying and affirming a patient's ambivalence about suicide when it is recognized.

The second evaluation, published in 2019, measured whether AMSR and other similar trainings increased the level of confidence and practice related to suicide-specific care among 137 providers located in three rural community behavioral health centers in Georgia (LoParo et al.,

2019). This study found that taking an AMSR training is associated with increase in self-reported confidence. The study further found that providers who are confident in their skills in assessing and treating suicide risk are more likely to incorporate best practices in their clinical work.

Current Study

Purpose

The two evaluation studies on AMSR to date found that this training improves clinicians' confidence, competence, and clinical practice in caring for potentially suicidal patients. Those studies, however, relied on clinicians' self-reports in drawing this conclusion. As a next step, the current study analyzed a measurable patient outcome: Readmission to inpatient service after initial assessment by AMSR-trained clinical staff after it was determined that outpatient care was sufficient to meet the patient's needs. The study aimed to answer the following research question:

> ***Are clinical staff trained in AMSR able to classify persons at risk for suicide into appropriate levels of care?***

Being able to appropriately direct patients to outpatient care, where “appropriate” is defined as no need for readmission or reclassification to inpatient care within the first 10 days after assessment, is a significant step toward ensuring the safety of patients and supporting use of the least restrictive care models.

The study followed patients who were placed in outpatient care (as opposed to inpatient care) after the intake assessment by AMSR, to see what percentage of them were readmitted to inpatient service within 10 days. The 10-day criterion was developed with an expert panel at facilities of a large healthcare system and represents a reasonable expectation of AMSR to direct patients to the appropriate level of care.

Data

We analyzed de-identified clinical data from a single facility in a large healthcare system during a 27-month period (October 2018–December 2020). It consisted of 560 cases in which adult patients came to the facility for a mental health crisis, and subsequently were placed to outpatient care after the intake assessment by the AMSR-trained clinical staff. Those 560 cases represented patients from 18 years to 85 years of age, with the mean age being 37 years. Note that some patients had multiple clinical episodes in the 27-month period, and consequently were represented in more than a single case.

Results of Analysis

Out of 560 total cases admitted to outpatient-level services, 224 cases had any readmission during the following 27-month period. The majority of the 224 patients (n = 171) were admitted a second time during the 27-months to the outpatient level of care. There were 53 cases where a patient was readmitted to an inpatient level of care during the 27-month window. Forty-eight AMSR-trained staff members were involved in the 560 cases analyzed.

Focusing on the 53 cases of inpatient readmission, we then analyzed the days lapsed between the date of intake assessment with AMSR and the date of inpatient readmission. The results are shown in Table 1 on the next page.

Table 1. Days Lapsed Between AMSR and IP Readmission

Days Lapsed	Frequency	Percentage	Cumulative Percentage
0–10	14	26.42	26.42
11–20	9	16.98	43.40
21–30	6	11.32	54.72
31–40	4	7.55	63.26
41–50	2	3.77	66.04
51–90	0	0.00	66.04
91–100	3	5.66	71.70
101	15	28.30	100.00
TOTAL	**53**	**100.00**	

Twenty-nine of those inpatient readmission cases happened within one month of the assessment, which account for over half of 53 inpatient readmission cases (54.7%) and one-twentieth of 560 cases examined (5.2%). Challenges exist in examining these rates in the context of extant literature. The field lacks a standard in operationally defining readmission, both in terms of timing (e.g., 30 days? 3 months? 1 year?) and in terms of where patients were discharged (e.g., inpatient or outpatient services).

There were 14 instances of admission to inpatient within 10 days following admission to outpatient and initial AMSR assessment, which account for about one-quarter of inpatient readmission cases (26.4%) and less than three percent of all cases examined (2.5%). Four of those 14 readmissions belonged to two patients who each had two separate episodes within 10 days. The remaining 10 cases belonged to patients with a single episode. Challenges exist in comparing how this rate of readmission compares with standard readmission rates, because existing research has not adopted the 10-day standard. Further, challenges exist in comparing how this rate of readmission compares with readmission rates seen by this hospital system prior to AMSR's adoption, as AMSR adoption and electronic records came onboard at the same time.

We then looked at patient demographic characteristics of those 14 cases where readmission to IP occurred within 10 days of AMSR assessment. In the 12 patients (14 cases), there was one male, 11 White patients and three Black patients, and nine divorced/single patients while two were married. (There were three cases with no information on marital status.) Tables 2, 3, and 4, below, show these results.

Table 2. Frequency of IP Readmission Within 10 Days of Assessment, by Gender

IP Readmit Within 10 Days	Male	Female	Total
No	200 36.63%	346 63.37%	546 100%
Yes	1 7.14%	13 92.86%	14 100%
Case Total	201 35.89%	359 64.11%	560 100%

Table 3. Frequency of IP Readmission Within 10 Days of Assessment, by Race

IP Readmit Within 10 Days	White	Black	Other/Unknown	Total
No	473 86.63%	47 8.61%	26 4.76%	546 100%
Yes	11 78.57%	3 21.43%	0 0.00%	14 100%
Case Total	484 86.43%	50 8.93%	26 4.64%	560 100%

Table 4. Frequency of IP Readmission Within 10 Days of Assessment, by Marital Status

	Marital Status				
IP Readmit Within 10 Days	**Married**	**Divorced**	**Single**	**Unknown**	**Total**
No	104 19.05%	39 7.14%	224 41.03%	179 32.78%	546 100%
Yes	2 14.29%	2 14.29%	7 50.00%	3 21.43%	14 100%
Case Total	106 18.93%	41 7.32%	231 41.25%	182 32.50%	560 100%

Using the above three tables, we compared representation of demographic groups between those of case total to those readmitted to IP within the 10-day window ("Yes" group). We noted that female, Black, or divorced patients have a higher-than-expected rate of readmission to IP within 10 days of an AMSR assessment. It is possible that AMSR-trained staff might have a more difficult time appropriately classifying patients from certain demographic groups at risk for suicide who warrant inpatient care. To investigate this possibility, we performed logistic regression analysis where these demographic characteristics were used as predictors for inpatient readmission within 10 days of AMSR assessment.

Specifically, we relied on multilevel logistic regression analysis to reflect the fact that multiple patient cases belonged to individual clinical staff making the level of care determination with AMSR. Use of multilevel logistic regression was necessary for the statistical test, as the risk for readmission may also be influenced by the characteristics of the clinical staff as well as those of the patient.

Among the 48 AMSR-trained staff members involved in the 560 cases analyzed, 12 staff members were involved with 14 cases where patients initially placed in outpatient care were readmitted to inpatient care within 10 days. In all 14 such cases, the clinical staff recorded that the patient "appears credible and consistent" in the intake form used during AMSR assessment.

Table 5 on the next page, presents the results of multilevel logistic regression analyses, which confirmed that AMSR-trained staff might have more difficulty in appropriately classifying female

patients at risk for suicide who warrant inpatient care. The analysis was insufficiently powered to confirm or deny the presence of such difficulty for classifying Black or divorced patients, and is presented here for exploratory purposes only.

Table 5. Likelihood of Readmission to Inpatient Care Within 10 Days, by Demographic Group

Group variable: staff_ID
Number of groups = 9
Log likelihood = -28.681321 Prob > chi2 = 0.0260

Variables		N	OR[1]	SE	z	P>|z|	95% conf. int.
Gender	Male	Reference Category					
	Female	267	8.75	9.49	2.00	**0.046***	1.044 - 73.346
Race	Not Black	Reference Category					
	Black vs. Not Black	267	3.06	2.63	1.30	0.193	0.568 - 16.518
Marital Status	Not Divorced	Reference Category					
	Divorced	267	4.46	3.95	1.69	0.091	0.790 - 25.250

[1] OR refers to odds ratio. Odds ratio larger than one, if significant, means the demographic characteristic makes the target event more likely. The target event in this analysis was "being readmitted to inpatient care within 10 days of being admitted to outpatient care."
*Significant at the p <.05 level.

Lastly, we examined whether the number of AMSR assessments performed each day might predict the likelihood of patients being readmitted to inpatient care within 10 days of the assessment. This analysis did not find any such association.

Implications and Next Steps

The current study was conducted as a small step toward evaluating the effectiveness of AMSR with measurable patient outcomes. Using the readmission to inpatient care within 10 days among patients initially recommended for outpatient care as our criterion, the study aimed to determine if the AMSR supported trained staff in appropriately placing patients in outpatient care. Our results suggest that the AMSR indeed supports safe and appropriate classification to outpatient admission in patients seeking psychiatric care. Our analyses found that only 2.5% of patients who were assessed by the AMSR-trained staff in the 2-plus–year period were readmitted to inpatient care within the defined 10-day period following outpatient admission.

The current study also found that being female presents a higher likelihood of readmission to inpatient care within 10 days of outpatient admission. This has a potential implication for the use of AMSR with female patients, in that the clinical staff may want to combine the use of AMSR with clinical judgement while recommending female patients to outpatient care.

There are some limitations to this study. First, we did not have data on appointments kept, frequency of appointments, and whether commitment to outpatient care was followed by the patient. Patient lack of engagement with treatment, more so than proper use of AMSR, could lead to worsening symptoms requiring a patient's reclassification to inpatient treatment. Second, we did not have data on the staff background characteristics, such as education levels and clinical experience, which may influence their ability to determine the appropriate level of care for patients. Finally, with such a small number of patients readmitted to inpatient status within the 10-day window following initial outpatient placement (n = 14), we had insufficient power to detect demographic differences in the ability of AMSR to appropriately classify patients.

The analyses of demographic differences suggested in this paper are intended only for preliminary exploration. Future studies should use a larger, more diverse initial sample to support investigation into AMSR's ability to appropriately classify by demographic characteristics (e.g., gender, race, and marital status). Should differences be identified, future studies also should explore why such differences exist. For example, AMSR could be more ineffectual in classifying individuals of color into appropriate placement, or experiences of racism, lack of access to culturally appropriate treatment, and other sociodemographic risk factors may make initial classification for some individuals into outpatient placement more difficult to sustain.

In summary, our study suggests that the AMSR-trained staff could rely on the AMSR to place patients appropriately and safely into outpatient care. Out of 560 cases examined, there were only 14 cases (2.4%) that needed to be readmitted to inpatient within 10 days of initial assessment and placement into outpatient care.

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Appendix. Details on Data Used in the Study

Data was pulled from two UHS databases—AMSR screening in the Electronic Medical Record (EMR) and the MIDAS patient encounter system. The data in the file includes AMSR assessments completed between 10/1/2018 and 12/31/2020, where the level of care determination was Partial Hospitalization (PHP) or Intensive Outpatient (IOP). Data pulled from the MIDAS system includes all patients discharged from PHP/IOP level of care from 10/1/2018 through 1/31/2021. If those patients had a subsequent episode of care after the PHP/IOP stay, the date and level of care fields were included. We then took only those encounters in MIDAS that matched with one of the patients in the AMSR file and added the date of the subsequent encounter and the Level of Care of that subsequent encounter to the AMSR. If there is an AMSR assessment but no subsequent encounter for that patient, that column will be blank, meaning that patient did not have another encounter in the identified date range.

Column/Header	Description
PID1	De-identified randomly assigned Patient Unique ID that remains the same for each encounter
PID2	De-identified randomly assigned Patient ID that identifies individual encounters
Sex	M or F
Race	Identified from patient demographics in billing system
Marital Status	Included if identified in AMSR assessment
Age	Age at time of AMSR assessment
Date/Time of Assessment/AMSR	The date that the AMSR assessment was completed that identified PHP/IOP level of care
AMSR LOC Determination	The level of care identified from the AMSR screening
Disposition	The actual level of care /program in which a patient was treated
Discharge Date/Time from PHP IOP	The date discharged from the PHP/IOP level of care that resulted from this AMSR screening

Length of Stay in OP	The number of days in this PHP/IOP episode of care
Next Admission Level of Care	If the patient had a subsequent admission to this facility following the identified PHP/IOP episode—identifies the level of care and program (Inpatient, PHP, IOP)
Next Admission Date	If the patient had a subsequent admission to this facility within the identified date range, the date of this next admission is included in this field
Admit to Inpatient Within 10 Days of AMSR Assessment	If patient had an inpatient admission following the identified AMSR assessment, was it within 10 days of the date of the AMSR assessment?

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