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ORIGINAL ARTICLE

Effectiveness of man therapy to reduce suicidal ideation and depression among working-age men: A randomized controlled trial

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Abstract

Objective: This randomized controlled trial of the online intervention, man therapy (MT), evaluated efficacy to reduce suicidal ideation (SI) and depression among working-aged men.

Method: Five-hundred and fifty-four men enrolled and 421 completed all surveys. Control Condition men explored the Healthy Men Michigan (HMM) website and Intervention Condition men explored HMM and MT. Hypotheses included men who used MT would report decreased SI and depression over time compared to Control Condition men.

Results: Latent growth curve modeling revealed improvements in SI (slope = -0.23 , $p < 0.001$, 95% CI: -0.29 , -0.16) and depression (slope = -0.21 , $p < 0.001$, 95% CI: -0.23 , -0.18) over time for men in both groups; however, there was no difference in slope based on group assignment. Depression, lifetime

Trial Registration: [ClinicalTrials.gov](https://clinicaltrials.gov). Assessing Online Interventions for Men's' Mental Health and Wellbeing. Clinical Trials ID: NCT02785471. Unique protocol ID: 10016178. Release date: 5/27/2016. URL: <https://register.clinicaltrials.gov/>

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suicide attempts, and interpersonal needs were associated with SI. Interpersonal needs and poor mental health were associated with depression. No group differences in change in risk and protective factors over time were observed. MT subgroup analyses revealed significant improvements in risk and protective factors.

Conclusion: While a direct effect of MT versus HMM on SI or depression was not observed, men in both groups improved. Results suggest online screening might play a role in reducing SI and depression among men and there are potential benefits to MT related to mental health, social support, and treatment motivation.

KEYWORDS

depression, man therapy, masculinity, men, mental health, suicide

INTRODUCTION

In 2019, there were over 47,000 U.S. suicide deaths (CDC, 2020) and more than 37,000 suicides were among working-age persons (16–64 years). Men ages 35–64 account for over 38% of all U.S. suicides (CDC, 2020). While research on interventions to reduce suicidal ideation and behavior among adults has increased, many existing programs have little impact on men's suicide risk. This limited observed impact on men is in part due to a lack of gender-specific interventions and lack of research on interventions specifically targeted toward working-aged men, despite their increased risk for suicide (Seidler et al., 2021; Suicide Prevention Research Center, 2016; Woolf & Schoemaker, 2019).

Traditional masculine gender norms are theorized to shape how men respond to depression and suicidal ideation (SI), such that some men try to hide their emotions in an effort to prove their masculinity. Masculine norms can restrict men's health-promoting behaviors and place men's health at even greater risk by discouraging emotional self-disclosure and encouraging excessive self-reliance (Wong et al., 2017). While more men today than in the past are seeking help for depression and suicide, there is a great need to continue to improve services for people of all genders. Regarding suicide prevention, there remain few interventions specific to suicide, or even focused on mental health, that have successfully engaged working-aged men in help-seeking and risk reduction (Galdas et al., 2005; Seidler et al., 2016). While many men do seek treatment for their mental health, men who rigidly embrace or conform to traditional gender norms, such as self-reliance and dominance (especially without flexibility), are often more resistant to and reluctant to acknowledge emotional issues. This resistance and reluctance can be a barrier to help-seeking and when coupled with men's tendency to engage in more high risk and impulsive behaviors, such as substance use and violence, may contribute to gender disparities observed in suicide

deaths (Addis, 2008; Courtenay, 2000; Wong et al., 2017). Men have historically often been socialized to control and restrict their emotions, demonstrate toughness, assert independence, and avoid perceived weakness (Magovcevic & Addis, 2008; O'Neil, 2008). Though these characteristics may be a source of pride for some men, they can also contribute to increased depression when they become barriers to help-seeking (Levant & Richmond, 2016; Van Orden et al., 2010). Risk factors such as unemployment and financial instability can cause stress among men and women, but for men who adhere to more stereotyped gender roles, they can view these risks as detriments to their perceived self-identity and role as a family provider, which can increase feelings of burdensomeness, a risk factor for suicide (Hill & Donatelle, 2005).

Although conformity to masculine norms has generally been associated with worse health outcomes, Gerdes and Levant (2018) found that a few norms were associated with positive results, particularly health promotion. Similarly, some dimensions of masculinity may be protective of suicide risk (Grigiene et al., 2022), including through enactment of the protective father role and viewing help-seeking as a way to regain self-control during times of severe depression (Oliffe et al., 2012).

Women more frequently seek mental health support and treatment than men (Wang et al., 2008). However, a longitudinal study by Ahmedani et al. (2014) found that 81% of men who died by suicide had visited a healthcare provider during the year before their death, indicating that help is being sought by at-risk men, but perhaps not being delivered in an optimal manner. It is important to recognize that improved suicide screening, risk management, and overall care are needed for all genders. Regarding men, the prevention field has developed programs and interventions focused on engaging this population in gender-responsive ways, which supports them to reconstruct healthier definitions of masculinity. Some of these programs include the Real Men, Real Depression public health campaign (Rochlen et al., 2005) developed

and implemented by the National Institute of Mental Health (NIMH), the MATES in Construction program in Australia (Gullestrup et al., 2011; Milner et al., 2019) and HeadsUpGuys, an online intervention for men with depression in Canada (Ogrodniczuk et al., 2018). While promising in design and early research, more investigation is needed to fully understand best practices for engaging men in learning about their mental health and encouraging action to reduce suicide risk. The current study builds on this emerging literature by testing the effectiveness of an online intervention designed for men called Man Therapy (MT). The purpose of MT is to reduce suicide risk, specifically SI and depression, which are the primary outcomes for this research.

MT was created to help men explore gender-specific issues that increase the risk for suicide and mental health problems, especially depression. MT attempts to change cultural norms to not only reduce suicide risk but also to reduce stigma about mental health, while encouraging men to view help-seeking as a sign of strength rather than weakness. Two models of suicide prevention used to evaluate MT's potential role in reducing SI and depression in this study include a clinical model of suicide assessment and response—the Continuum of Suicidality for Risk Assessment (CSRA; Bryan & Rudd, 2006) and the Social-Ecological Suicide Prevention Model (SESPM; Cramer & Kapusta, 2017). Bryan and Rudd's seminal work incorporates research on the assessment of suicidality and describes a continuum for assessment and response. Many of the assessment areas they document in their research (see Table 1 in Bryan & Rudd, 2006, p. 189) are risk and protective factors used in the creation of MT to help men use online assessments to identify risk and encourage men to take appropriate responses for help-seeking. Given the clinical focus of CSRA, the researchers compared this model to the SESPM which includes a broader, public health assessment of suicide risk. Many of the risk and protective factors included in the SESPM overlap with CSRA yet are described in a way to provide additional context to understand the content on the MT website, especially risk and protective factors at the individual level noted in SESPM (see Table 1 in Cramer & Kapusta, 2017, p. 4–5). Variables that overlapped in both models and that were important to the aims of MT (see below) were selected for use evaluating MT for this study. The inclusion of both models expanded the ability to evaluate clinical and public health-focused variables connected to MT's aims to reduce suicide risk in men. Each of the model variables used in this evaluation is further described in the Measures section and in Table 2.

MT's specific aims include helping: (1) men to explore how gender socialization influences their relationships and mental health; (2) to reduce stigma about mental

TABLE 1 Sample characteristics of the Total sample

Variable	No. (%)
Overall	377 (100.0%)
Race	
White	328 (89.1%)
Black or African American	29 (7.9%)
Asian	4 (1.1%)
American Indian or Alaska Native	6 (1.6%)
Ethnicity	
Hispanic or Latinx	19 (5.0%)
Education	
Less than high school	3 (0.8%)
Some high school (did not graduate)	6 (1.6%)
Graduated high school / Received GED	51 (13.5%)
Some college (did not graduate)	129 (34.2%)
Graduated college (received degree)	119 (31.6%)
Any graduate level education (e.g., Master's, PhD coursework or degree)	69 (18.3%)
Employment status	
Employed for wages or salary	222 (58.9%)
Self-employed	30 (8.0%)
Not employed for wages or salary for less than 1 year	33 (8.8%)
Not employed for wages or salary for more than 1 year	21 (5.6%)
Homemaker	3 (0.8%)
Student	13 (3.4%)
Retired	12 (3.2%)
Unable to work	41 (10.9%)
Declined to answer	2 (0.5%)
Living status (Relationship)	
Single	96 (25.6%)
Married / CU / DP	133 (35.5%)
Living with partner	66 (17.6%)
Partnered, living separately	33 (8.8%)
Divorced/Separated	39 (10.4%)
Widowed	2 (0.5%)
Other	6 (1.6%)
Sexual orientation	
Heterosexual/Straight	294 (78.0%)
Gay / Lesbian / Homosexual	44 (11.7%)
Bisexual	20 (5.3%)
Other	6 (1.6%)
Not sure	8 (2.1%)
Decline to answer	5 (1.3%)
Current living situation	

(Continues)

TABLE 1 (Continued)

Variable	No. (%)
I am living alone	71 (18.8%)
I am living only with my immediate family	193 (51.2%)
I am living with an adult child or children	6 (1.6%)
I am living with my (or my spouse's / partner's) parents	46 (12.2%)
I am living with my (or my spouse's / partner's) extended family	11 (2.9%)
I am living with a roommate(s)	50 (13.3%)

Abbreviations: CU, Civil union; DP, Domestic Partner; GED, General Educational Development.

health and suicide; (3) to empower men to seek help; and (4) to reduce suicide risk. MT frames its approach around hope and resilience, while integrating humor throughout the website. These strategies were implemented in response to what men told developers of MT they wanted in a suicide prevention online program. Feedback about MT suggests that humor “may be a good tool in men's mental health promotion” (Spencer-Thomas et al., 2014). Humor has been identified as an important consideration for the success of men's mental health programs and community public health campaigns (Erentzen et al., 2018).

At the time of this publication, the MT website had more than 1.1 million visits since its launch in 2012 and overall response to the program has been positive. Prior research suggests that men respond favorably to the website; stating that resources were helpful and that they would share with friends (Brooks-Russell et al., 2014; Spencer-Thomas et al., 2014). To date, there have not been any formal evaluation studies of MT employing a randomized controlled trial (RCT). This study used a RCT to test the efficacy of MT over a three-month follow-up period to reduce SI and depression among working-age men. While another important outcome of MT is to improve help-seeking behaviors, this study focused on clinical outcomes—specifically SI and depression—while Gilgoff et al. (in press) focused on broader help-seeking behaviors resulting from use of MT as compared to the Control Condition, Healthy Men Michigan (HMM).

The present study tested the following hypotheses: (H1a) Participants in the MT group will demonstrate a greater decrease in SI compared to participants in the HMM group; (H1b) SI will be associated with risk and protective factors for suicide; (H2a) Participants in the MT group will demonstrate a greater decrease in depression compared to participants in the HMM group; (H2b) Depression will be associated with risk and protective factors for suicide; and (H3) Participants in the MT group will demonstrate greater improvements in risk and protective factors over time compared to participants in the

HMM group. Primary risk and protective factors, identified by two leading models of suicide prevention related to desired outcomes from using MT, are described in detail in the Measures section. The trial is registered on the United States National Institutes of Health Clinical Trials Registry ([ClinicalTrials.gov](https://clinicaltrials.gov) Identifier # NCT02785471 available online at: <https://clinicaltrials.gov>). The study was conducted in accordance with the World Medical Association (Declaration of Helsinki) and approved by the author affiliated University Institutional Review Board.

METHOD

Research design and procedure

The researchers employed a two-group, longitudinal, RCT to evaluate MT's effectiveness to reduce SI and depression among working-aged men, as compared to an anonymous online screening and referral website which served as the Control Condition. The Consolidated Standards of Reporting Trials (CONSORT) design for the trial can be viewed in Figure 1.

To recruit men throughout Michigan, the researchers created a statewide public health suicide prevention campaign called Healthy Men Michigan (HMM). The researchers worked closely with the developers of MT to create online (e.g., social media, email) and print materials (e.g., wallet cards, posters, flyers) that were used to encourage men to visit the online website and take a free and anonymous screening focused on depression and suicide. While the MT website itself remained intact to allow for evaluation, we worked closely with community organizations throughout the state to customize online and printed materials that would appeal to Michigan men, while using themes from MT to engage men in thinking about their own risk and help-seeking behavior. The research team developed unique content around sports, fitness, hanging out with friends, work, and other topics that would be relevant to men. Sports-themed ads included messages such as ‘put a full-court press on your mental health’ (basketball) and ‘it's like a driving range for your mental game’ (golf). The team also developed specific messages for targeted occupational groups that are at higher risk for suicide such as first responders (“it's like first aid for your brain”), veterans (“give your mental health a good spit shine”), and miners (“trapped in a bad mood? You don't have to dig yourself out alone”). Researchers also created newsletters, webinars, Twitter chats, digital ads, press releases and interviews, public service announcements, and free print materials for community partners.

As introduced above, HMM was promoted using *high tech* (i.e., social media, television, radio) and *high touch*

TABLE 2 Risk and protective factors

Measure	Description and citation	CSRA	SESPM	HMM pre	HMM post	MT pre	MT post
				Mean(SD) or frequency			
Risk factors							
CDC Health Related Quality of Life (HRQOL) (Physical Health)	Single item indicator for past 30 days; Range 0–30 with higher values representing more worse days (CDC, 2000)	Yes	Yes	6.97 (8.95)	7.59 (9.35)	8.55 (10.61)	7.39 (9.17)
CDC Health-Related Quality of Life (HRQOL) (Mental Health)	Single item indicator	Yes	Yes	16.66	13.29 (9.82)	16.89 (9.32)	13.33 (9.88)
History of family suicide	Single item indicator	No	Yes	40% – Yes	N/A	49% – Yes	N/A
Financial Industry Regulatory Authority (FINRA) (Financial Distress)	Measures satisfaction with current personal financial condition. Range 1–10 with higher scores representing greater satisfaction (Applied Research & Consulting, LLC, 2009)	Yes	Yes	1.96 (0.75)	2.05 (0.76)	2.02 (0.77)	2.05 (0.79)
NIDA Quick Screen (I) (Substance Use)	Scale developed by the National Institute on Drug Abuse (NIDA) and includes two items that identify illicit drug use and nonmedical use of prescription drugs. (NIDA n.d.)	Yes	Yes	30% – Yes	24% – Yes	29% – Yes	24% – Yes
NIDA Quick Screen (P) (Substance Use)	Scale developed by the National Institute on Drug Abuse (NIDA) and includes two items that identify illicit drug use and nonmedical use of prescription drugs. (NIDA n.d.)	Yes	Yes	18% – Yes	15% – Yes	19% – Yes	14% – Yes
Alcohol Use Disorders Identification Test (AUDIT – C) (Alcohol Use)	A 3-item brief screening of alcohol use; Range 0–15 with higher scores representing greater alcohol use (Bush et al., 1998)	Yes	Yes	0.61 (0.68)	1.16 (0.92)	0.56 (0.66)	1.06 (0.89)
Harvard National Screening Day Scale (HANDS) (Depression)	A 10-item scale that measures the frequency of major depressive episode symptoms in the past 2 weeks. The scale consists of items based on the DSM. Range: 0–30 with higher scores representing more frequent depressive symptoms; $\alpha = 0.87$ (Baer et al., 2000)	Yes	Yes	14.98 (5.32)	11.09 (5.80)	12.86 (5.73)	11.21 (5.88)

(Continues)

TABLE 2 (Continued)

Measure	Description and citation	CSRA	SESPM	HMM pre	HMM post	MT pre	MT post
				Mean(SD) or frequency			
Columbia suicide severity rating scale (Items 1–5) (Suicide Ideation)	The C-SSRS is a self-report measure used to rate an individual's degree of suicidal ideation on a scale, ranging from “wish to be dead” to “active suicidal ideation with specific plan and intent.” Range 0–5 with higher scores representing greater risk (Nam et al., 2018; Posner et al., 2011)	Yes	Yes	1.18 (1.48)	0.73 (1.13)	1.34 (1.55)	0.77 (1.21)
Columbia suicide severity rating scale (Item 6 – Lifetime) (Prior Suicide Attempt)	Single item for lifetime suicide attempt (Posner et al., 2011)	Yes	Yes	36% – Yes		42% – Yes	
Sexual orientation	Dichotomous item of “queer” or “heterosexual”	Yes	No	33% – Queer		18% – Yes	
Interpersonal Needs Questionnaire (INQ)	Assesses perceived levels of belongingness and burdensomeness. Range 0–30 with higher scores representing greater distress; $\alpha = 0.86$ (Parkhurst et al., 2016)	Yes	Yes	11.49 (5.44)	11.44 (6.24)	12.42 (6.15)	11.83 (7.06)
Perceived stigma and barriers to care for psychological problems (Stigma Subscale) (Stigma)	A 6-item subscale designed to assess perceived stigma of psychological problems. Range 6–30 with higher scores representing more perceived stigma; $\alpha = 0.92$ (Britt et al., 2008)	No	Yes	14.70 (6.20)	15.85 (6.02)	14.96 (6.40)	15.72 (8.23)
Employment status	Current employment status – employed or unemployed	Yes	Yes	33% – Unemployed		43% – Unemployed	

TABLE 2 (Continued)

Measure	Description and citation	CSRA	SESPM	HMM pre	HMM post	MT pre	MT post
				Mean(SD) or frequency			
Protective factors							
General Help-seeking behavior for suicidality (GHSB) (Problem Solving related to reaching out to people for help)	Sum score of likelihood of contacting 10 persons for help. Range 10–70 with higher scores representing greater likelihood; $\alpha = 0.85$ (Wilson et al., 2005)	Yes	Yes	34.98 (8.59)	36.65 (10.07)	35.03 (10.45)	37.32 (10.78)
Multidimensional scale of perceived social support (MSPSS) (perception of social support)	This 12-item scale is a brief research tool designed to measure perceptions of support. Range 12–84 with higher scores representing greater perceived support; $\alpha = 0.94$ (Zimet et al., 1988)	Yes	Yes	52.03 (17.21)	53.60 (17.42)	48.79 (20.28)	52.62 (18.17)
Attitudes toward seeking professional psychological help (ATSPPH) (Treatment Motivation)	A 10-item scale measures attitudes toward seeking mental health treatment. Range 10–40 with higher scores representing more positive attitudes; $\alpha = 0.84$ (Fischer & Farina, 1995)	No	Yes	25.33 (2.66)	29.89 (5.55)	25.31 (3.18)	29.08 (6.24)
Active participation in mental health treatment	Dichotomous item indicating began seeing a counselor (only included starting to see a counselor)	Yes	Yes	9% – Yes	19% – Yes	9% – Yes	17% – Yes

(i.e., flyers, posters, wallet cards, articles) strategies. The researchers posted on Facebook and Twitter with ads and information about the website, the latest news and research on topics related to men's mental health, and activities of our community partners. Using a grassroots, high-touch approach, the researchers created a state-wide coalition that included over 230 advocacy groups as well as public health and behavioral health groups who promoted the HMM campaign to reach working-aged men and encourage them to take a free online screening on the HMM website. The partner list included health and behavioral health organizations, but the HMM public health campaign engaged many more organizations where suicide prevention was not part of their mission, including workplaces, community organizations, faith-based organizations, social and fitness clubs, professional and recreational sporting groups, among other individuals and

organizational community leaders. Consistent with a public health approach to prevention, diverse organizational partners were deliberately engaged to reach men throughout the community, whether or not they provided mental health treatment. HMM partners were essential in promoting the campaign while disseminating information about suicide and referring individuals at high risk for suicide to mental health services. The most common response to the question about how men heard about the HMM website was through their home/neighborhood (26%), followed by mental health/behavioral health organization (19%), employment setting (13%), and community organization (12%).

Once on the HMM website, men completed a voluntary, anonymous screening (T1; see details below). Men met inclusion criteria for the study based on age (25–64), living in Michigan, and reported score as “at risk”

for suicide (ideation or behavior); and/or moderate- to high-risk for depression. Given the strong correlation between anger and depression among men (Martin et al., 2013), the researchers invited men who scored at moderate or high risk for anger in addition to those who met the SI and depression inclusion criteria. Only 12 men who scored at moderate or high risk for anger did not score at moderate or high risk for depression or any risk for suicide, so for purposes of this study, these men were excluded from the analysis given they were such a small group. Eligible participants were invited to read the online informed consent form before agreeing or declining to participate in the study. Once they agreed, participants were randomly assigned to one of two groups: Group One, the HMM Control Condition group or Group Two, the MT Intervention Condition group. Randomization schedules for the study conditions were created online using a computer-generated randomization sequence which took place immediately after online screening and consent. The researchers did not know what group eligible participants would be assigned to. All participants received standard care online with immediate feedback about their personal screening results and referrals to local and national suicide and mental health resources on the HMM website. After receiving personalized results, participants in the MT Intervention group were routed and encouraged to explore the MT website in a new web browser. Participants in the HMM Control group received immediate feedback about their screening and referrals to resources; however, they were not informed about or routed to the MT website.

After enrolling and completing the initial screening survey on the HMM website (Baseline; T1), participants were sent an email confirming their participation and notified of the upcoming 2-week survey (T2). The initial T1 screening focused only on SI, depression, and basic demographics. After completing the T1 survey, eligible men were invited to participate in the study and randomly assigned to one of the two groups. SI and depression were measured three times over the course of the 3-month study.

Participants were asked to complete the T2 survey 2 weeks after enrolling in the study. This survey included the scales for suicide and depression, but also the risk and protective factors that were based on timeframes of 2–4 weeks recall and not expected to change between the time of completing the initial screening (T1) and this expanded survey at T2. At 12 weeks after enrollment, participants completed the final T3 survey which again asked about suicide and depression but also asked about risk and protective factors that could be compared to T2 and additional questions regarding self-report help-seeking

behaviors. Participants were emailed a \$20 Amazon gift card after completing T2 and a \$30 Amazon gift card after completing T3.

Participants

After completing the online T1 survey, men were invited to participate in the study if they lived in Michigan, were 25–64 years old and responded positively to any of the questions asked on the Columbia Suicide Severity Rating Scale (C-SSRS; Posner et al., 2011) and/or scored at moderate to high risk for depression on the Harvard Department of Psychiatry/NDS Scale (HANDS; Baer et al., 2000).

Eligible men were randomly assigned to one of two groups. Group One (HMM Control Condition) instructed men to complete a 5-min online survey for depression and SI, based on National Depression Screening Day (www.mindwise.org). Men then received immediate risk feedback and referrals. Men assigned to Group Two (MT Intervention Condition) completed the same survey, received immediate feedback and referrals, but were also routed and encouraged to explore the MT website (www.ManTherapy.org) in a new web browser. At this point in the study, the intervention of MT was introduced, but men could go back during any time during the study and explore the site again and the majority (62%) reported viewing the MT site more than one time during the 3-month period.

A total of 3205 men were invited to participate in the study (September 2016 to January 2019 with follow-up continuing through May 2019). Of those, 753 (24%) consented and 554 enrolled [275 in Group 1 (HMM) and 279 in Group 2 (MT)]. Men assigned to Group 2 (MT/intervention) were strongly encouraged to visit the MT website, but not required; therefore, in this analysis, we only included men assigned to Group 2 who also visited the site (205 of 279; 73%). Of the possible 480 men, 379 completed all three surveys and were included in this final analysis (See Consort Diagram, Figure 1). There were no statistical differences for race/ethnicity, health insurance, geographical location, age, and sexual orientation for men who visited or did not visit the MT site. There were more married men in the group that did not visit MT. Additionally, there were no statistical differences observed in the primary outcomes (depression and SI) between men in the MT and the HMM group at T1. Regarding potential differences among eligible men who enrolled and those who declined to enroll in the study, men who scored higher on depression and SI were statistically more likely to enroll in the study.

Consort Diagram: Eligibility, Enrollment, and Participation

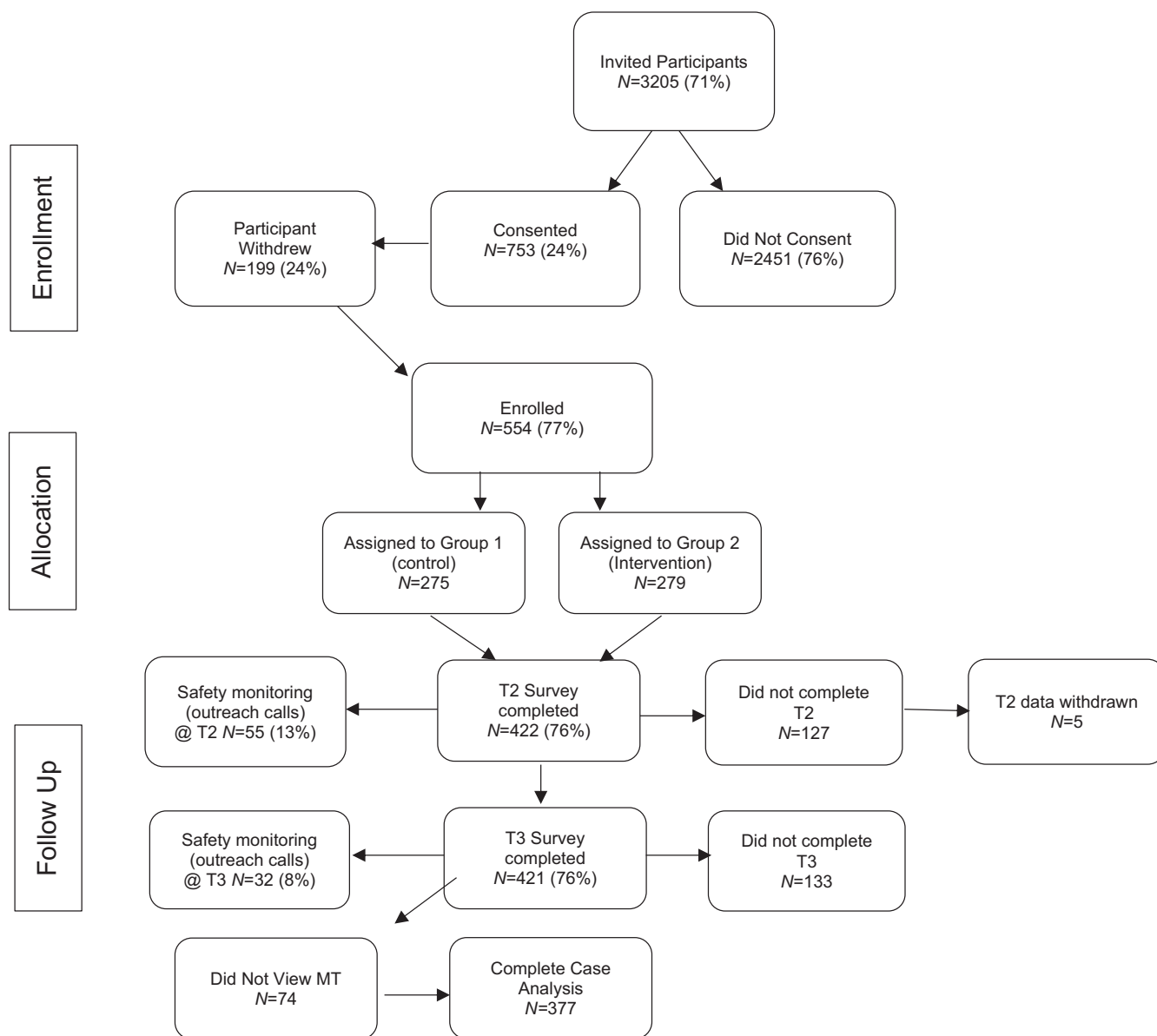


FIGURE 1 Consort diagram: Eligibility, enrollment, and participation

Almost 90% men ($n = 377$) were White, followed by Black or African American (8%), Hispanic or Latinx (5%), American Indian or Alaska Native (1.6%), and Asian (1%). The majority (84%) completed some college or higher, and 60% were employed. Almost 20% identified as gay, bisexual or queer, which was higher than expected. Finally, single versus married/civil union/domestic partners were about equal. When compared to the 2018 U.S. Michigan Census data, men in the sample closely resembled men in Michigan for race, age, and geographic location. See Table 1 for sample demographics and frequencies. Regarding the primary outcomes, 63% of the men screened positive for suicide risk and 92% reported moderate to high risk for depression.

Measures

The list of variables with their measurement scales and/or items that were used as co-variables in the current study can be viewed in Table 2. The following section provides more detail about how the variables of interest (risk and protective factors) for outcomes were defined and scored.

Primary outcomes

To assess SI, we used the first five questions of the Columbia Suicide Severity Risk Screener (C-SSRS; Posner et al., 2011) as utilized to assess ideation in prior research

(Nam et al., 2018). Each question was answered yes or no, and positive responses were scored one point. The total scale ranged 0–4. The sixth item of the C-SSRS asks about lifetime and recent suicide attempts and based on our theories, response to this question was included in the predictive model as a covariate.

We used the Harvard Department of Psychiatry/NDS Scale (HANDS; Baer et al., 2000) to assess episodic symptoms of major depression within the past 2 weeks. The HANDS is comprised of 10 items with responses ranging from 0 = None or little of the time to 3 = All of the time. Higher scores suggest increased depression and the scale demonstrated strong reliability ($\alpha = 0.87$).

Co-variates: Risk and protective factors

Given the objectives of MT to reduce SI and depression, while also working to strengthen suicide protective factors and reduce risks related to suicide, the researchers developed a comprehensive model of suicide risk by integrating the two aforementioned models that relate specifically to the MT intervention: SESPM (Cramer & Kapusta, 2017) and CSRA (Bryan & Rudd, 2006). With regard to co-variates, the researchers compared both models and identified primary risk and protective factors that were included in both models and directly aligned with the goals and outcomes of MT. These variables were used as mediators and are listed and described in Table 2. Table 2 includes two columns that indicate if specific risk and protective factors were present in one or both models (CSRA and/or SESPM) in addition to a description and citation for each scale.

From the two models, 13 risk variables were identified that were present in both models and central to the aims of MT. These included acute physical health and mental health problems, financial distress, substance use (i.e., illicit and prescription drug use), alcohol use, depression, prior suicide attempt, sexual orientation, interpersonal needs including thwarted belongingness and burdensomeness and unemployment. In our integrated model for evaluating MT, we also included stigma and family history of suicide. Both were noted as important in SESPM but not included directly in the CSRA model. Finally, we included SI as a co-variate when predicting depression.

Four protective factors were identified, including the “General Help-Seeking Behavior for Suicidality scale” that measures problem solving focused on reaching out to people for help—specifically family and friends as noted in the CSRA model specifically and referenced in part by SESPM as an example of coping skills (Wilson et al., 2005). We also included perceived social support (Zimet et al., 1988), active participation in mental health

treatment, and employment status which were all noted as important protective factors in the two models. Finally, we included a measure of treatment motivation, measured by the Attitudes Toward Seeking Professional Psychological Help (ATSPPH; Fischer & Farina, 1995) scale although this protective factor was not explicitly named in the CSRA model.

Taken together, the variables described above and in Table 2 used as co-variates in this paper, help to define clinical outcomes related to MT that predict suicide, including risk for SI and depression and protective factors related to suicide risk over time. The CDC (Stone et al., 2017), through their public health approach to suicide prevention, recommends a broad, multidimensional approach which involves promoting protective factors and minimizing risk factors.

Analysis

A series of structural equation models were used to assess the study hypotheses. H1a and H2a were assessed using a longitudinal latent variable model testing the intercept and slope for SI and depression over time by group. Data on suicide and depression were collected at three time points (T1: baseline, T2: 2 weeks, T3: 12 weeks). Data in latent growth curve modeling are described by latent change factors (i.e., *means* and *slopes*) that estimate both group-level change and individual-level change. Intercept values were estimated by fixing factor loadings at each time point to one. Slope values were then estimated by assigning fixed factor loadings representing the three time points. H3 was examined via path analysis, testing for group differences in the change in risk and protective factors over time. Risk and protective factors were measured at two time points (T2: 2 weeks, T3: 12 weeks), concurrent with assessment of suicide and depression scores (T2: 2 weeks, T3: 12 weeks). Change in risk and protective factors was calculated as T3 scores minus T2 scores. For interpretation, improvement in risk factors is demonstrated by negative values and improvement in protective factors is demonstrated by positive values. Additionally, based on the initial results and described below, an exploratory sub-group analysis was conducted to examine changes in risk and protective factors over time for participants in the MT group.

Maximum-likelihood estimation with robust standard errors (MLR) was used to correct for non-normal distributions and minimize the impact of missing data. Missing data ranged from 0 to 20% at T3 depending on variable of interest. Participants lost to follow-up were compared to participants who completed T3, and data were found to be missing at random per Little's MCAR Test ($X^2 = 4.95$; $df = 7$, $p = 0.67$). Analyses were based on complete case

data. Guidelines provided by Hu and Bentler (1999) and Kline (2005) were used as model fit criteria (RMSEA < 0.05, CFI/TLI > 0.90, SRMS < 0.08). Hypotheses H1b and H2b were assessed with path analysis with T3 scores on SI and depression as the primary outcomes. Unstandardized parameter estimates, p -values, and 95% confidence intervals are provided in text.

RESULTS

Descriptive statistics for all model constructs and variables at each time point by group are provided in Table 2. This includes means, standard deviations, differences in scores over time, and Cronbach's α s for all variables and scales. Standardized parameter coefficients and confidence intervals are provided in Tables 3 and 4. Table 5 reports group differences in model covariates.

Suicidal ideation

LGCM results for H1a indicate a statistically significant intercept ($b = -1.25$, $p < 0.001$, 95% CI: 1.11, 1.38) and slope ($b = -0.23$, $p < 0.001$, 95% CI: -0.29 , -0.16). No statistically significant effect was observed for group assignment on intercept ($b = 0.05$, $p = .25$, 95% CI: -0.11 , 0.43) or slope ($b = -0.05$, $p = 0.32$, 95% CI: -0.24 , 0.06). Although there was no group effect, the negative slope indicates that SI scores decreased over time. Fit statistics indicate acceptable fit of the model to the data ($\chi^2 = 3.49$, $p = 0.06$; RMSEA = 0.07, CFI = 0.99, SRMR = 0.02).

Path analysis results for H1b indicated that depression scores, lifetime suicide attempt, and interpersonal needs scores were associated with suicidal ideation at T3. As anticipated, depression scores were positively associated with suicidal ideation ($b = 0.48$, $p = 0.003$, 95% CI: 0.17, 0.79). Lifetime attempt was also associated with suicidal ideation ($b = 0.29$, $p = 0.01$, 95% CI: 0.06, 0.53), interpersonal needs scores were similarly associated with suicidal ideation ($b = 0.72$, $p < 0.001$, 95% CI: 0.32, 1.13). These results indicate that increased depression, lifetime history of attempt, and interpersonal needs were linked to higher suicidal ideation. No other variables were statistically related to suicidal ideation. A large effect size was detected for suicidal ideation at T3 ($R^2 = 0.28$, $p < 0.001$). This model was *just identified*, indicating perfect fit with the data.

Depression

Changes in depression over time were assessed using LGCM, and the results yielded statistically significant

effects for intercept ($b = -1.53$, $p < 0.001$, 95% CI: 1.48, 1.58) and slope ($b = -0.21$, $p < 0.001$, 95% CI: -0.23 , -0.18). Group assignments were not associated with intercept ($b = 0.09$, $p = 0.08$, 95% CI: -0.01 , 0.19) or slope ($b = -0.03$, $p = 0.16$, 95% CI: -0.08 , 0.01). Although there was no group effect, the negative slope indicates that depression scores decreased over time. Results indicated acceptable fit between the model and the data ($\chi^2 = 4.17$, $p = 0.12$; RMSEA = 0.05, CFI = 0.99, SRMR = 0.01).

Results for H2b yielded several associations between risk and protective factors and depression at T3. Prior month mental health problem was positively associated with depression, with more days of poor mental health (acute mental health) associated with depression ($b = 0.02$, $p < 0.001$, 95% CI: 0.01, 0.003). Interpersonal needs were similarly associated with depression ($b = 0.31$, $p < 0.001$, 95% CI: 0.14, 0.48). These results indicate that more days over the prior month described as negative mental health and higher interpersonal needs were linked to higher depression scores. No other variables were statistically related to depression. A large effect size was detected for depression at T3 ($R^2 = 0.46$, $p < 0.001$). This model was *just identified*, indicating perfect fit with the data.

Changes in risk and protective factors

Results indicated that there were no statistically significant differences between the study groups in the change in any risk or protective factor over time. While not statistically significant, most scores on the risk and protective factors improved in the desired direction in both groups. However, we did observe that scores on the AUDIT-C (alcohol) and days of poor quality of physical health got worse over time (the latter was only observed for the HMM group). We are not able to provide explanations for this in the current study. Review of descriptive statistics suggested that there might be within group changes over time in each study group on some of the risk and protective factors. Given the exploratory nature of this study as the first to empirically evaluate online interventions for SI, the researchers conducted additional sub-group analysis to look at potential changes in risk and protective factors for participants in each group.

Using an adjusted $\alpha = 0.01$, statistically significant differences were observed in the MT group for one risk factor and three protective factors in the theoretical model. On average, men in the MT group reported a 3.56-day reduction ($SD = 9.60$; $p < 0.001$; 95% CI: -5.05 , -2.07) in days impacted by negative mental health (acute mental health) over the past month. Additionally, men in the MT group also reported improvements in perceived problem solving focused on social support ($M_{diff} = 3.82$,

$SD = 17.75$; $p = 0.007$; 95% CI: 1.08, 6.57), problem solving focused on reaching out to people for help, measured by the General Help-Seeking Behavior for Suicidality scale (GHSB; $M_{diff} = 2.29$, $SD = 9.97$; $p < 0.001$; 95% CI: 0.75–3.83), and treatment motivation, measured with the Attitudes Toward Seeking Professional Psychological Help scale (ATSPPH; $M_{diff} = 3.77$, $SD = 6.92$; $p = 0.004$; 95% CI: 2.70, 4.84). These results suggest there may be benefits to using MT, but additional research is needed.¹ A statistically significant within-group difference was also detected for the HMM Control group for reduction in days impacted by negative mental health (acute mental health) over the past month ($M = -3.21$, $SD = 9.27$; $p < 0.001$; 95% CI: -4.53 , -1.89), which was similar to what was observed in the MT group.

DISCUSSION

This study describes the results from the first RCT evaluating the online intervention, Man Therapy (MT). Prior research on MT has focused on utilization and satisfaction

of the online program, and while feedback has generally been positive by people who have used MT, there has been a dearth of effectiveness studies with regard to outcomes focused on SI and depression. Results from this RCT showed that overall, men in both the Intervention Condition (MT) and Control Condition (HMM) groups improved over time with regard to SI and depression, although the changes in scores are small. We did not, however, observe a statistically significant improvement among men in the MT Intervention group as compared to the HMM Control group. Reasons for not seeing improvement could be due to many factors, including that MT might not be strong enough as a stand-alone intervention to reduce depression and SI. It is not intended to be a manualized clinical intervention, but rather a tool to engage men in thinking about and making healthy choices related to their suicide risk and help-seeking behavior. Men in the MT group had an opportunity to visit the website more than once throughout the study, so there could be differences for men who spent more time on the site. This could not be objectively measured in the present study, but would be good for future research to build in capacity

TABLE 3 Standardized coefficients and 95% CIs for predicting suicidal ideation

Covariates (T2)	Intercept	Slope	T3
H1a			
Study group	0.05 (−0.04, 0.15)	−0.05 (−0.16, 0.05)	
H1b			
Study group			0.10 (−0.09, 0.11)
Family history of suicide			0.05 (−0.05, 0.15)
Physical health—30 days			0.01 (−0.10, 0.17)
Mental health – 30 days			−0.05 (−0.18, 0.08)
FINRA—financial distress			−0.04 (−0.14, 0.07)
MSPSS—perceived social support			0.02 (−0.10, 0.13)
C-SSRS*—suicidal ideation			0.12 (0.02, 0.22)
HANDS*—depression			0.22 (0.08, 0.36)
INQ*—interpersonal needs			0.34 (0.21, 0.45)
Stigma			−0.08 (−0.18, 0.01)
GHSB—problem solving with family & friends			0.05 (−0.07, 0.16)
ATSPPH—treatment motivation			0.03 (−0.07, 0.13)
AUDIT-C—alcohol use			−0.01 (−0.11, 0.09)
NIDA_PD—substance use (prescription drugs)			−0.02 (−0.12, 0.09)
NIDA_ID—substance use (illicit drugs)			0.09 (−0.01, 0.20)
Engagement—active participation in treatment			−0.03 (−0.13, 0.07)
SexOrientation—sexual orientation			0.07 (−0.03, 0.17)
Employment			0.03 (−0.07, 0.13)
Effect size*			$R^2 = 0.27$

* $p < 0.05$.

to measure potential dose effects. Additionally, the RCT was designed based on best practices for suicide prevention research that includes comprehensive safety monitoring that provided participants with suicide prevention resources throughout the duration of their participation in the study. Just the offering and encouragement to use resources as part of the required IRB supports for the study may have also contributed to non-significant results as men in both groups improved over time.

Given the improvement in both groups over time, the researchers conclude that using technology such as online screening and interactive websites, should be considered as a strategy to engage men, improve their health and well-being, and prevent fatalities through targeted mental health services and suicide treatment. The use of MT provides practitioners, and program planners with another “tool in the toolbox” as the team at MT would say to contribute to a comprehensive suicide prevention program for organizations, workplaces, and communities. Incorporating public health campaigns and online programs such as MT into comprehensive suicide prevention is recommended by the CDC, and similar programs, such as Real Men, Real Depression have been

used in the past to engage men in their working years (Rochlen et al., 2005).

The successful promotion of online interventions, such as MT, is both an art and science. The research team worked closely with the creators of MT to engage men in this study through online Facebook, Twitter, and Instagram ads that used less traditional mental health messaging and more graphics and information that would be relatable for men. In addition to the high-tech promotion, the value of high-touch promotion and working with over 230 community partners throughout Michigan to recruit men into the present study cannot be understated. Working with partners, including men who shared their story and encouraged peers to go online to the HMM site, helped to share the creative, humorous, and informative messages about MT and was a key driver in recruiting men to this RCT, which historically working-aged men are a challenging group to study in non-clinical settings. Both anonymous screening and online support appear to be important tools that should be used with male-focused marketing to reach men in their working years as the researchers accomplished with the HMM project. MT is freely available online at www.ManTherapy.org, making it easily accessible

TABLE 4 Standardized coefficients and 95% CIs for predicting depression

Covariates (T2)	Intercept	Slope	T3
H2a			
Study group	0.09 (−0.01, 0.19)	−0.12 (−0.30, 0.05)	
H2b			
Study group			−0.02 (−0.11, 0.06)
Family history of suicide			0.06 (−0.04, 0.15)
Physical health—30 days			−0.04 (−0.14, 0.06)
Mental health—30 days*			0.26 (0.15, 0.36)
FINRA—financial distress			−0.05 (−0.14, 0.05)
MSPSS—perceived social support			0.01 (−0.14, 0.11)
C-SSRS—suicidal ideation			−0.05 (−0.14, 0.04)
INQ*—interpersonal needs			0.35 (0.22, 0.47)
Stigma			−0.01 (−0.01, 0.09)
GHSB—problem solving with family & friends			−0.04 (−0.15, 0.06)
ATSPPH—treatment motivation			−0.01 (−0.09, 0.09)
AUDIT-C—alcohol use			−0.04 (−0.13, 0.05)
NIDA_PD—substance use (prescription drugs)			0.09 (−0.01, 0.19)
NIDA_ID—substance use (illicit drugs)			0.03 (−0.07, 0.13)
Engagement—active participation in treatment			0.08 (0.01, 0.17)
SexOrientation—sexual orientation			0.01 (−0.08, 0.10)
Employment			−0.09 (−0.18, 0.19)
Effect Size*			$R^2 = 0.39$

* $p < 0.05$.

TABLE 5 Standardized coefficients and 95% CIs for predicting model covariates

Covariates (T2)	HMM	MT	T3
H2a			
Study group	0.09 (−0.01, 0.19)	−0.12 (−0.30, 0.05)	
H2b			
Study group			−0.02 (−0.11, 0.06)
Family history of suicide			0.06 (−0.04, 0.15)
Physical health—30 days			−0.04 (−0.14, 0.06)
Mental health—30 days*			0.26 (0.15, 0.36)
FINRA—financial distress			−0.05 (−0.14, 0.05)
MSPSS perceived social support			0.01 (−0.14, 0.11)
C-SSRS—suicidal ideation			−0.05 (−0.14, 0.04)
INQ—interpersonal needs			0.35 (0.22, 0.47)
Stigma			−0.01 (−0.01, 0.09)
GHSB—problem solving focused on reaching out to friends & family			−0.04 (−0.15, 0.06)
ATSPPH—Treatment motivation			−0.01 (−0.09, 0.09)
AUDIT-C—alcohol use			−0.04 (−0.13, 0.05)
NIDA_PD—substance use—prescription			0.09 (−0.01, 0.19)
NIDA_ID—substance use—illicit			0.03 (−0.07, 0.13)
Engagement—active participation in treatment			0.08 (0.01, 0.17)
SexOrientation—sexual orientation			0.01 (−0.08, 0.10)
Employment			−0.09 (−0.18, 0.19)
Effect size*			$R^2 = 0.39$

* $p < 0.05$.

for any program or individual that wants to share the resource with other men. States, such as Michigan, paid to license MT which provided technical support, custom data reporting, and additional customization of the site with regard to referral resources in the state, in addition to working with the MT creators to develop state-specific creative materials and resources to help with recruitment. MT continues to expand its online resources to respond to the changing needs of working-aged men and, based on this study, we are finding that men throughout the state were able to access and use the resource, which can be a support as they consider the need for treatment, wait to see a provider for an assessment, or to use as a support in-between therapy sessions.

The additional analyses in the present study examining the integrated model of suicide risk and adapting for depression reaffirmed what we know from prior research regarding predictive factors for suicide in men and depression. While some risk factors such as prior suicide attempt history and poorer mental health over the past 30 days are unmodifiable, interpersonal needs (i.e., thwarted belongingness and belongingness) are risk factors that could be influenced by programs like MT as a way to contribute to reduced SI and depression. These

two factors have been shown in prior research to be significant predictors of suicide among working-age men and future enhancements to the MT program should consider targeting these risk factors specifically. The additional exploratory analysis, examining changes in risk and protective factors among men in the MT group were interesting and have potential for future research in men's suicide prevention and mental health. Specifically, men in the MT group reported improvement over time in regard to fewer days of poor mental health, improved social support, problem solving focused on reaching out to friends and family members for help, and attitudes toward professional psychological help-seeking. While not a pre-established hypothesis of this study and lacking a control group for these exploratory analyses, there appears to be something happening among the men who use MT and this should be studied further as potential outcomes of MT that focus on risk and protective factors for suicide and depression.

MT was designed to not only reduce the clinical risk of suicide and depression, but also to positively impact risk and protective factors related to suicide which should be studied further in future research. This research could use a true control group to further test SI and depression

outcomes, and to consider the impact of MT on men who do not score at risk for suicide or depression. The role and impact of risk and protective factors should also be further explored. These variables were treated as mediators in the current analyses based on the theoretical and clinical perspective that these factors serve as primary agents of change impacting secondary outcomes. It may be informative to assess these factors in the context of moderators as well in future research on MT.

Interventions that can be offered online and scaled up to reach men throughout communities, including workplaces, are important additions to comprehensive suicide prevention programming. Web-based resources, such as MT, can play an important role in suicide prevention to engage men in considering risk and help-seeking, while educating them about resources. This study provides support to the idea that programs such as MT should be part of a comprehensive, community-based intervention to reduce suicide and depression risk and increase resilience (Cramer & Kapusta, 2017). MT's strategy to engage men using a mix of hope, resilience, and humor is a promising intervention to consider as we work to develop and adapt programs that meet the needs of all men, and persons from all genders (Galdas et al., 2005; Suicide Prevention Research Center, 2016; Wong et al., 2017).

Regarding limitations, results cannot be generalized beyond working-aged men living in Michigan. While our sample closely matched U.S. Census data at the time of the study, it is not representative of other states. Our sample lacks generalizability regarding conformity to masculine norms that often differ among cultural groups and people from diverse racial groups and ethnicities. While our results suggest that the online programs may have contributed to reduced suicide ideation and depression, it is possible that the men in the study improved over time separate from any intervention or other unmeasured confounders. It is also possible that the HMM website itself contributed to reduced SI and depression and that both the HMM Control group and the MT Intervention group improved, but that the MT group did not improve more than the control condition. Additionally, measures were limited to online self-report; however, the use of standardized measures increased reliability and validity. The impact of time spent on the MT website could not be measured and this is an important variable to consider in future research as engagement with the website over the 3 months and what sites the men viewed over time would be useful to consider. MT is working to update their platform so that men can log into a unique profile when they return to the site. This planned feature will be helpful for researchers to track time and pages viewed onsite that might impact outcomes. Study strengths included the utilization of a RCT with a large state-wide sample of men and the use of latent

variables to measure risk and resilience as they were novel to this body of research. More research on MT and other online screening and referral programs is warranted.

In conclusion, this study showed that online screening for men has potential to reduce SI and depression over time. Regarding MT, this study suggested that the online program may have a role in increasing protective factors for suicide while reducing risk factors. Working-aged men who are at higher risk for suicide, are generally harder to engage in help-seeking behaviors (Galdas et al., 2005; Möller-Leimkühler, 2002). Given the increasing risks of suicide related to the ongoing COVID-19 pandemic and expected mental health long-lasting outcomes post-pandemic, MT could also be an intervention that responds to recently published guidelines encouraging us to expand “anti-stigma education and pro-help-seeking messaging using creative strategies” and to “increase community-level services and use of technology and virtual mechanisms” for populations at risk (pE4) (Moutier, 2021).

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ENDNOTE

¹Note: Figures from the SEM are available upon request.

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