



Heroes Health Final Report

Prepared by Institute for Trauma Recovery
University of North Carolina, Chapel Hill
January 2022



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1. Acknowledgements

Heroes Health would not have happened without the contributions of a great many individuals and organizations, who worked tirelessly to help us serve healthcare workers. We are extremely grateful to One Mind, The Rockefeller Foundation, The Bank of America Charitable Foundation, Google, The Draper Richards Kaplan Foundation, The Sozosei Foundation, and Medallia.

2. Executive Summary

This Final Report summarizes the Heroes Health Initiative's activity and outcomes from July 1, 2020 through December 31, 2021.

The Heroes Health Initiative supports healthcare worker mental health via the Heroes Health app, a free app available to healthcare workers anywhere in the US via download from the App Store (iPhone) and Google Play Store (Android). After download, the app notifies workers each week that a brief mental health symptom assessment is available. This assessment evaluates symptoms in key domains such as sleep, stress, anxiety/worry, and depression/sadness. Immediately after survey completion, workers receive a summary report of their symptoms, trends in their symptoms over time, links to immediate crisis support, and other mental health resources.

In addition, workers at healthcare organizations that partner with Heroes Health have the option to confidentially share their individual mental health summaries with an organizational mental health or peer support worker. This organizational worker contacts healthcare workers reporting moderate or severe symptoms and/or suicidal thoughts to offer thanks and support, a conversation, or help setting up an appointment with a mental health professional. In partnering organizations, the contact number for this mental health support worker/peer counselor is also listed in the app, allowing workers to contact them for confidential support and resources.

Thanks to seed funding provided by our generous funders, the Heroes Health Initiative served 1,640 healthcare workers through the Heroes Health app and partnered with twelve healthcare organizations across the United States from July 1, 2020 through December 31, 2021.

While Heroes Health has reached the end of its funding cycle, we are delighted that the Heroes Health program will continue to live on and serve healthcare workers. The University of North Carolina at Chapel Hill is transferring Heroes Health product ownership to Marvin, a company specializing in digital mental healthcare delivery. (No user data has been or will be transferred from UNC Chapel Hill to Marvin.) UNC is providing Heroes Health to Marvin free of charge, on the condition that Marvin will continue to provide Heroes Health to clinicians free of charge.

3.2. Building the Heroes Health App

UNC Chapel Hill was fortunate to collaborate with X – a technology incubator owned by Google’s parent company, Alphabet – and Boston Technology Corporation (BTC) in planning and building the Heroes Health app. BTC remains involved in modifying the application and preparing a new iteration of the app, run by Marvin.

3.3. Launching Heroes Health

Heroes Health successfully launched on July 14, 2020. Publicity for the launch included multiple local and national media outlets including *The Today Show*, *Fox Weekend HQ*, and *Business Wire*.



Figure 1. Heroes Health Principal Investigator, Dr. Samuel McLean, discusses Heroes Health with *The Today Show* anchors Al Rocher and Sheinelle Jones on July 15, 2020.

3.4. Advertising Heroes Health

The Heroes Health team continued to advertise the app throughout the funding period. Advertisements for Heroes Health did not end with our launch day campaign. Heroes Health has been highlighted in local and national healthcare and news publications, including *Emergency Medicine News*, *Modern Healthcare Magazine*, and *Forbes*.

In addition, our student volunteer team contacted many healthcare institutions in COVID-19 hotspots around the country during the first half of the Initiative and managed a Twitter account, which remained active through May 2, 2021.

We also advertised extensively for the Heroes Health Initiative at partnering institutions via print materials (Figure 2) and email campaigns. For example, in early 2021 we advertised Heroes Health at employee COVID-19 vaccination centers at partnering institutions.



Heroes Health Initiative

You are doing so much for *others*. Heroes Health is to support you.

JEFFERSON CARES ABOUT YOUR MENTAL WELL-BEING

JOIN HEROES HEALTH, AN APP-BASED INITIATIVE AND STUDY FOR HEALTHCARE WORKERS

TRACK YOUR WELLNESS WITH 5-MINUTE SURVEYS

LET JEFFERSON LEADERSHIP KNOW HOW WE'RE DOING

ACCESS JEFFERSON-SPECIFIC RESOURCES

Summary Report: Week of May 17, 2020

You reported that this past week:

Your sleep quality was	Fairly Bad
Your feelings of sadness or depression were	Not completed
Your feelings of worry or anxiety were	None or minimal
Symptoms of posttraumatic stress were	None or minimal
Your limitations in day-to-day life due to your mental health were	None or mild

Trends

ANXIETY

AUGUST 2020 - OCTOBER 2020



I am comfortable with the level of PPE supplies where I work.

Strongly agree

Somewhat agree

Neither agree nor disagree

Somewhat disagree

Strongly disagree

Not applicable

Wellness Resources

Thank you for participating in the Heroes Health Initiative. UNC Health is grateful for your tireless efforts to support and protect your community, and appreciates the opportunity to support you and your colleagues through these difficult times.

During an infectious disease outbreak like COVID-19, it is not uncommon for people to experience feelings of fear, depression or anxiety. Colleagues and providers are urged to practice self-care and use the confidential support resources below. Please reach out if you need help.

If you are in a life-threatening emergency, please call 911.

Your Organization's Resources

Employee Assistance Program

Monday-Friday, 8 am to 7 pm
(232) 456-7890



It is so important for all of us to take care of our own mental health and to support each other as best we can. The purpose of the study is to provide healthcare workers helpful resources for monitoring and supporting their overall mental well-being. **Your participation is completely voluntary and confidential!**

Download on the **App Store**

GET IT ON **Google Play**



Visit our site

If you have questions about participating in Heroes Health, please see our website <https://heroeshealth.unc.edu/> or write to heroeshealth@unc.edu. Heroes Health is a research study of the University of Chapel Hill, North Carolina's Institute for Trauma Recovery. Principle Investigator: Dr. Samuel McLean. IRB # 200823. IRB contact: (919)966-3113



Heroes Health Initiative

You are doing so much for *others*. Let us support you.

UNC CARES ABOUT YOUR MENTAL WELL-BEING.

JOIN HEROES HEALTH, AN APP-BASED INITIATIVE AND RESEARCH STUDY FOR HEALTHCARE WORKERS.



Track your wellness with 5-minute surveys



Get support and access UNC-specific resources



Let UNC leadership know how we're doing

PARTICIPATION IS VOLUNTARY AND CONFIDENTIAL!

If you choose to participate in Heroes Health as a UNC affiliate, you may receive a supportive call from an H3 team member if you report mental health symptoms.

Any outreach is confidential. Our goal is to support you and your wellness!



If you have questions about participating in Heroes Health, please see our website <https://heroeshealth.unc.edu/> or write to heroeshealth@unc.edu. Heroes Health is a research study of the University of Chapel Hill, North Carolina's Institute for Trauma Recovery. Principle Investigator: Dr. Samuel McLean. IRB # 200823. IRB contact: (919)966-3113

GET IT ON **Google play**

Download on the **App Store**



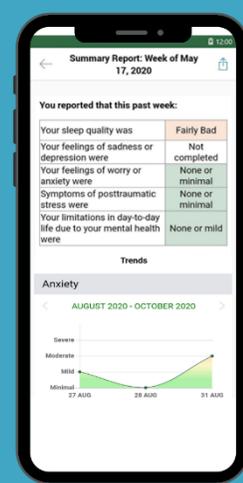


Figure 2. Example flyer (left) and poster (right) advertising Heroes Health to healthcare workers at partner organizations.

We further advertised Heroes Health via our webpage (<https://heroeshealth.unc.edu>). Between July 1, 2020 and December 31, 2021, over 386,000 unique devices accessed the Heroes Health website over 478,000 times, illustrating its reach among and resonance with healthcare workers. Specific supports offered by the website (beyond links to the app itself) include informational articles, links to wellness resources (the most frequently accessed of which are Headspace, BetterHelp, and Happify), and discounts to ease the financial burden of the pandemic (Figure 3). *In sum, thoughtful digital and print advertising helped Heroes Health reach healthcare workers throughout the COVID-19 pandemic.*

Heroes Health Initiative
You are doing so much for others. Heroes Health is to support you.

Join Heroes Health + Newroom Blog + Resources Discounts FAQ Give

Home / Discounts for Healthcare Workers and First Responders

Discounts for Healthcare Workers and First Responders

Download Heroes Health to your smart device:
 GET IT ON Google Play
 Download on the App Store
 App Feedback
 Follow

I am an Individual Worker I am an Organizational Leader

To ease the financial burden on healthcare workers and first responders like you, we've compiled a listing of current discounts available to COVID-19 workers. Importantly, Heroes Health receives no financial benefit or support from the goods or services listed. Our only goal is to provide resources that might be of use to you.

Apparel Discounts

Adidas
As a special thank you for your service, verified medical professionals, first responders, nurses and military members can enjoy an exclusive 30% off discount.

Asics
To support you in every brave step, Asics is offering 40% off all full-priced products for medical professionals and first responders.

Figure 3. Screenshot of the most viewed page on the Heroes Health website, "Discounts".

3.5. Partnering with Healthcare Organizations

As was discussed in the Heroes Health Interim Report, long institutional approval processes were a challenge in launching Heroes Health at partnering organizations. Nonetheless, the Heroes Health team persevered in attracting new organizations and shepherding them through the onboarding process through the end of the award period, ensuring that as many healthcare workers as possible could benefit from the Initiative.

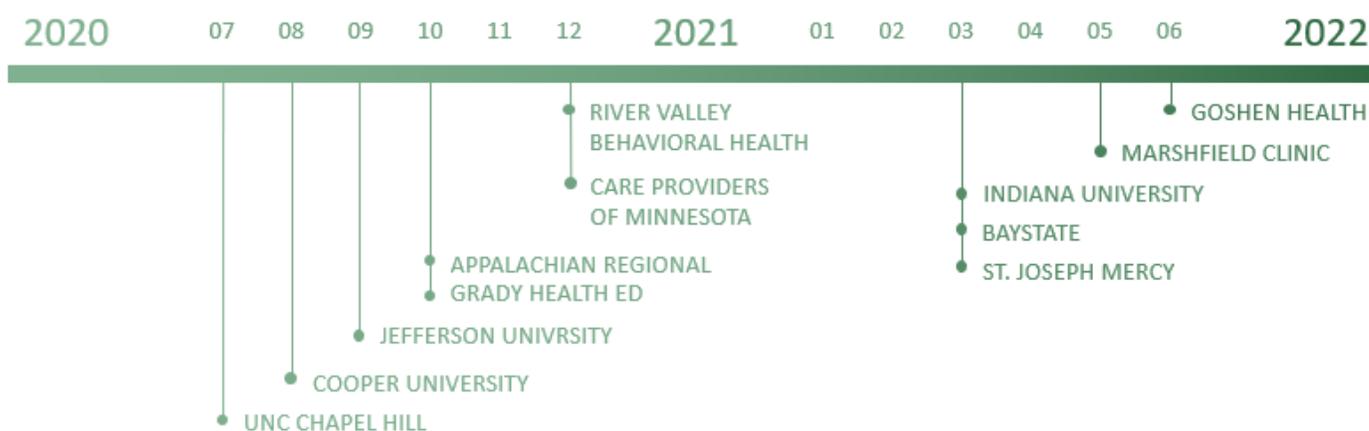


Figure 4. Heroes Health partnership timeline. Abbreviation: emergency department (ED).

As noted in the Heroes Health Interim Report, the Heroes Health team learned several lessons that may benefit similar initiatives in the future:

- Buy-in from high-level leadership at partner organizations is key to a successful launch.

- *Multiple communication channels between a partner organization and their workforce over a sustained period of time is far more effective than a single email campaign.*
- *A pre-emptive text message or email makes workers more likely to answer a subsequent support call.*
- *A peer-to-peer approach to mental health outreach is particularly effective.*
- *The most effective means of improving the quality of the outreach is to foster a community of outreach workers across sites, in which mental health outreach workers across sites learn from one another, share best practices, and encourage one another.*

Heroes Health enables institutional outreach teams to easily and confidentially reach out to those most in need through a streamlined process. For users to be flagged for outreach, they must be affiliated with one of our partner institutions and report suicidal ideation, high symptom burden (HSB), or moderate symptom burden (MSB) in their weekly symptom screener. Once flagged, user contact information is shared with affiliated partner institution mental health professionals for targeted outreach.

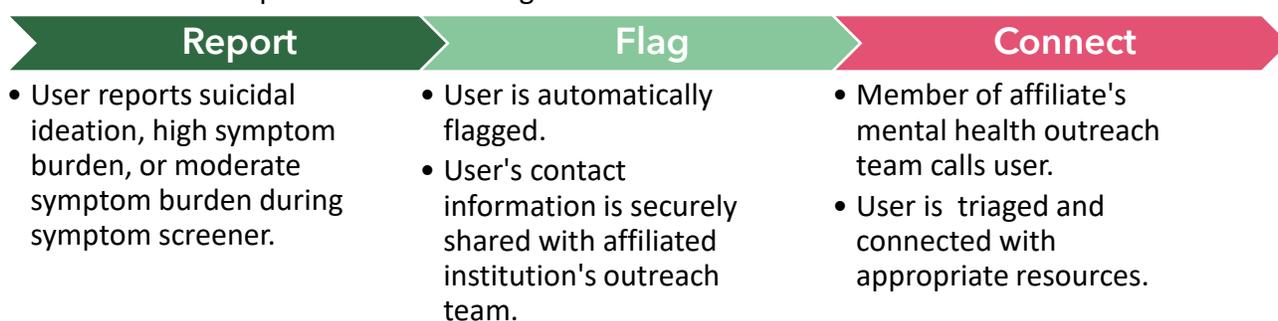


Figure 5. Process of reporting, flagging, and intervening against suicidal ideation, high symptom burden, and moderate symptom burden.

From fall 2020 through fall 2021, UNC Chapel Hill hosted regular calls between frontline healthcare support personnel at the above-listed organizational partner sites, allowing us to collaboratively formulate best practices for handling mental health support calls. In fall 2021, these meetings transitioned to a bi-weekly basis and focused on a successful handoff of Heroes Health from UNC Chapel Hill to Marvin.

3.6. Improving Heroes Health throughout the Award Period

Throughout the award period, the Heroes Health Initiative maintained a growth mindset, diligently soliciting feedback from users, mental health support team members, and organization leadership on how the Initiative could be further optimized. This feedback guided the following improvements:

- **August 2020:** BTC created a separate test environment that allowed the study team to experiment with and vet potential enhancements.
- **September 2020:** BTC launched an improved symptom trend reports in the app (Figure 6) and push notifications informing users when a new symptom assessment was available.

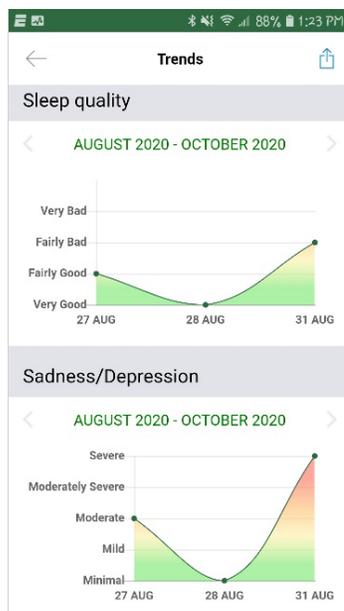


Figure 6. Improved symptom trend report, color-coded to provide intuitive insight regarding symptom severity.

- **October 2020:** UNC Chapel Hill launched a mental health call/outreach data form (Figure 7), allowing mental health outreach workers at partnering institutions to easily organize and update information regarding daily outreach efforts to individuals reporting mental health symptoms.

Name	Email	Phone	Times Flagged	Date Flagged	Interaction Typ	Prior Contact Stat	Interaction Resul
Jane Doe	jdoe@email.com	555-555-5555	1	9/15/2020	Initial Phone	No prior contact	Full conversation
Monica Bowman	mb@email.com	123-456-6789	1	10/2/2020	Initial Phone	No prior contact	Full conversation
Wolfgang Mozart	wam@email.com	999-999-9999	1	10/15/2020	Initial Phone	No prior contact	Partial conversation
Wolfgang Mozart	wam@email.com	999-999-9999	1	10/15/2020	Repeat Phone	Partial prior contact	Full conversation
Hal McCormack	hal@email.com	987-654-4321	1	1/4/2021	Initial Phone	No prior contact	Partial conversation
Jane Doe	jdoe@email.com	555-555-5555	2	1/4/2021	Initial Email	No prior contact	Email

Figure 7. Example mental health outreach tracker.

UNC Chapel Hill also developed a variety of information resource sheets to help mental health outreach workers at organizational partner sites provide tailored resources to flagged users (examples shown in Appendix 1).

- **December 2020:** We reduced the frequency of questions regarding institutional support and PPE from weekly to monthly. (Brief mental health assessments remained weekly.)
- **January 2021:** We streamlined symptom surveys from five surveys to one survey, reducing the number of clicks and swipes necessary to complete them.

3.7. Disseminating Findings from the Heroes Health Initiative to the Scientific Community

- Scientific conference activities were greatly limited during the award period due to COVID.
- We are currently drafting a manuscript describing the development, data collection methods, and key findings from the Heroes Health Initiative. This manuscript has been led by Michelle Ikoma, MPH under the mentorship of Heroes Health Principal Investigator, Samuel McLean, MD, MPH.

3.8. Transitioning Heroes Health to Marvin for Sustainability

While funding for the Heroes Health Initiative has ceased, our dedication to America's healthcare workforce persists. The University of North Carolina at Chapel Hill has continued to coordinate the Initiative since the end

funding on June 30, 2021 and, to ensure the continued life of Heroes Health, transitioning the Initiative to Marvin.

- Marvin is a company founded in 2020 that specializes in delivering teletherapy to physicians, nurses, and other clinicians.



Figure 8. Marvin logo.

- Heroes Health will join a portfolio of other clinician wellness services offered by Marvin, including weekly video calls with licensed therapists, meditation training, mood analytics, and online workshops.
- Marvin is collaborating with UNC Chapel Hill and Boston Technology Corporation to design and launch a refresh of the Heroes Health app.
- Importantly, no user data will be transferred from UNC Chapel Hill to Marvin.
- Following the launch of the Marvin-branded Heroes Health app, Marvin will formally relaunch each partner organization. Our twelve active partner organizations are aware of the upcoming transition and are already in contact with Marvin's team.
- **Heroes Health's services, including outreach from Marvin to users reporting substantial mental health burden, will remain free to healthcare workers.**
- Eventually, the UNC-branded Heroes Health app will be discontinued from Apple's App Store and Google's Play Store, and will be accessed through Marvin.
- ***Through Marvin, Heroes Health will continue to serve healthcare workers at current organizations and new healthcare organizations, throughout the United States.***

4. Data Collected Demonstrate the Need for the Heroes Health Initiative

At time of enrollment, 24% of users reported moderate-to-severe depressive symptoms, 30% reported moderate-to-severe anxiety symptoms, 43% presented posttraumatic stress symptoms, 47% reported moderate-to-severe impact on role functioning, and 47% reported fairly-to-very bad sleep quality (Figure 9). These findings illustrate the need for interventions, like Heroes Health, to support the healthcare workforce throughout the COVID-19 pandemic.

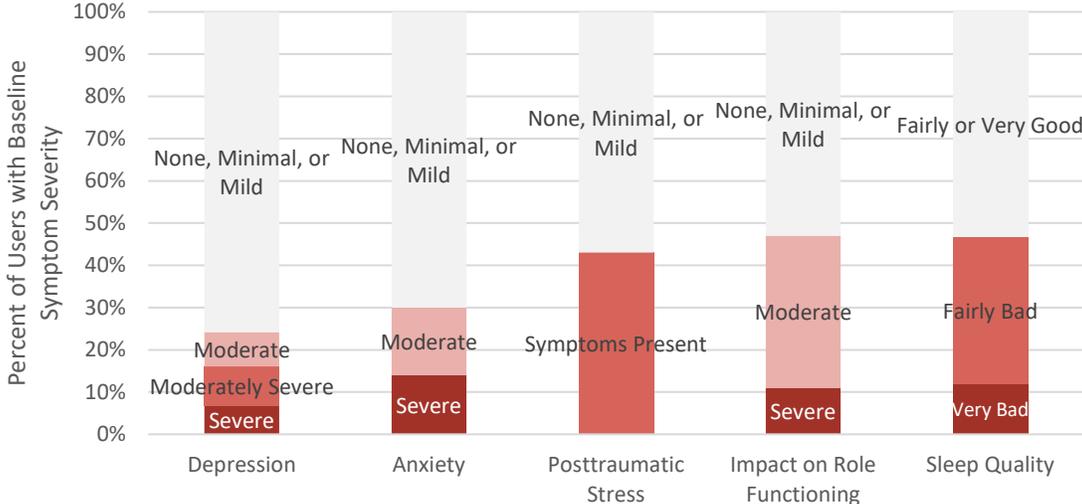


Figure 9. Baseline (i.e., at time of enrollment) symptom severity among Heroes Health users.

Due to data privacy restrictions/data collection restrictions at some partner sites, only a fraction of user experience data from the Heroes Health data is available. Yet even within this fraction of data available, 39 cases of suicidal ideation, 114 cases of high mental health symptom burden, and 64 cases of moderate mental health symptom burden were identified among 486 healthcare workers at partner institutions (Figure 10). These data demonstrate the tremendous symptom burden among Heroes Health users, and the success of the program in identifying suffering healthcare workers to link up to care.

39 ever reported suicidal ideation



114 ever reported high symptom burden



64 ever reported moderate symptom burden



269 never reported moderate-to-severe symptom burden

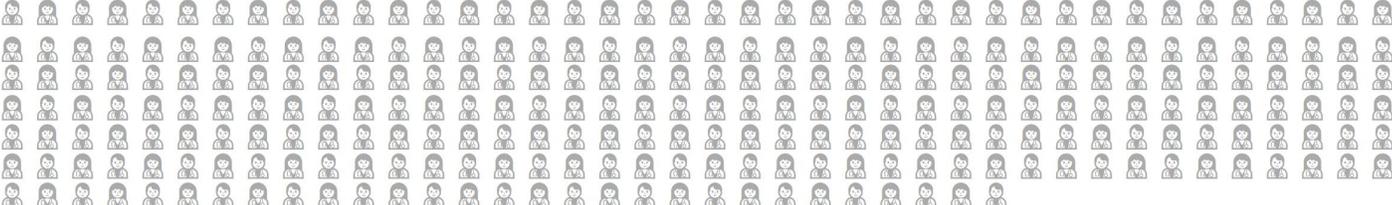


Figure 10. Proportion of Heroes Health users at partner institutions ever reporting suicidal ideation, high symptom burden, or moderate symptom burden.

5. Heroes Health Initiative Outcomes

5.1. 12 Organizational Partnerships Launched

In our proposal, the Heroes Health Initiative set a goal of establishing five institutional partnerships. **We surpassed this goal, ending the funding period with twelve partnerships.**

As was discussed in our interim report, partnerships amplified the impact of Heroes Health by allowing users to confidentially share their information with a mental health support worker/team at their organization. This mental health support team then contacts individuals reporting suicidal ideation and/or substantial mental health burden and offers personalized, one-on-one support. Moreover, the Heroes Health team provides weekly aggregate reports to institutional leaders, empowering them to understand and adapt to the needs of their workforce. As such, partnerships between the Heroes Health Initiative and healthcare organizations across the United States were key in the expansion and impact of the Initiative.

Since launching in July 2020, the Heroes Health Initiative launched partnerships at The University of North Carolina (UNC), Chapel Hill, NC; Cooper University Hospital, Camden, NJ; Jefferson University Hospital, Philadelphia, PA; Grady Health Emergency Department, Atlanta, GA; Appalachian Regional Health Care, Boone, NC; River Valley Behavioral Health, Owensboro, KY; Care Providers of Minnesota, Bloomington, MN; Indiana University Health, Indianapolis, IN; St. Joseph Mercy, Ann Arbor, MI; Baystate University, Springfield, MA; Marshfield Clinic, Marshfield, WI; and Goshen Health, Goshen, IN.



Figure 11. Heroes Health partner organizations across the United States. Abbreviation: emergency department (ED).

Consistent with our interim findings, Heroes Health users at partner organizations consistently reported lower depression, anxiety, and posttraumatic stress symptom severity than their peers at non-affiliated organizations (Figure 12). This may in part reflect the dual benefits of (1) organizations' partnership with Heroes Health

communicating a commitment to their employees' wellness and (2) individualized outreach by partner organizations, informed by Heroes Health data.

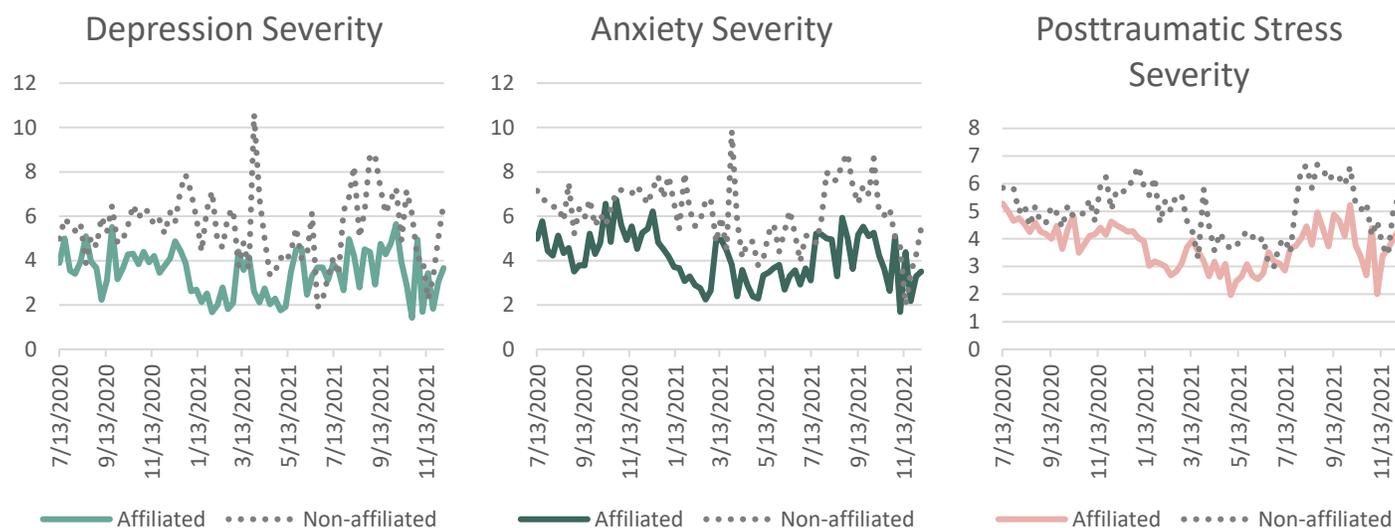


Figure 12. Depression, anxiety, and posttraumatic stress severity among users at affiliated and non-affiliated organizations.

Heroes Health users at partner organizations also reported a greater magnitude of symptom reduction 4-to-8 weeks post-enrollment than their peers at non-partner organizations (Figure 13), suggesting that the benefits of partnership (e.g., users receiving personal outreach based on symptom severity) were associated with tangible mental health improvements.

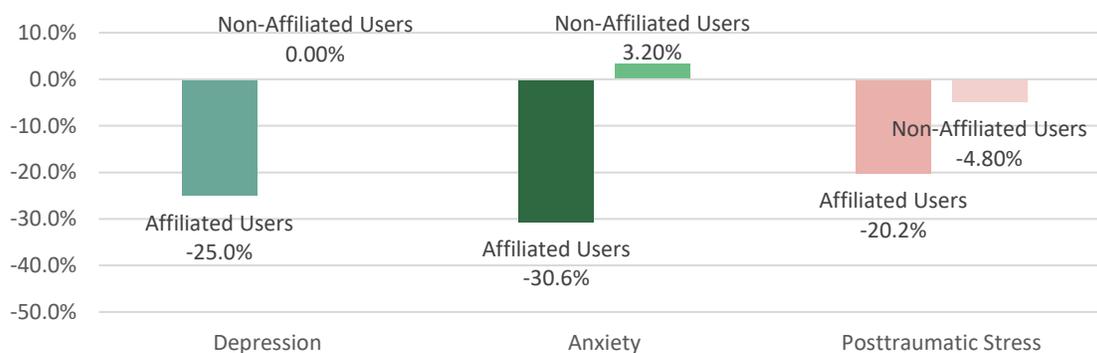


Figure 13. Percent change in symptom reduction from baseline to 4-to-8 weeks post-enrollment, by affiliation status.

5.2. Even among the Fraction of User Data Available, Nearly 1,000 Outreach Attempts Made

Outreach teams successfully contacted and deployed resources to healthcare workers most in need. As noted above, due to data privacy restrictions/data collection restrictions at some partner sites, only a fraction of user experience data from the Heroes Health data is available. Yet even within this fraction of data available, Heroes Health Contact logged ~1,000 outreach attempts to connect with 217 healthcare workers flagged for contact. Among this sample, phone calls were the primary mode of communication used by outreach team members, accounting for 60% of all contact attempts, followed by emails (34%) and text messages (6%). Call durations ranged from 1 to 53 minutes, with the average call lasting 13.1 minutes.

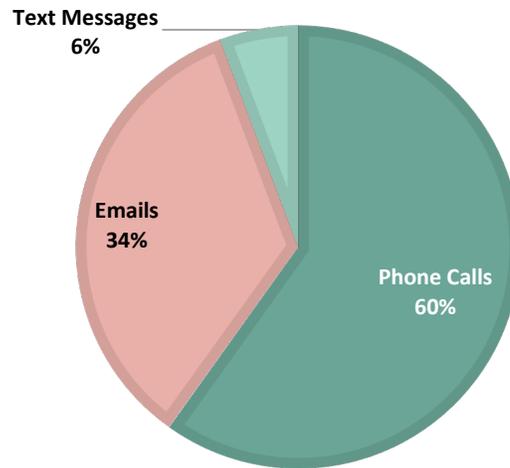


Figure 14. Proportion of contact attempts made via phone, email, and text message.

This sample of data demonstrate the kind of benefits received by Heroes Health program users. For example, within this sample, 44 frontline healthcare workers received immediate psychotherapy or problem solving, 36 healthcare workers were referred to an employee assistance program, 27 healthcare workers were referred to web- or app-based resources, 18 healthcare workers were referred to an employer-associated mental health provider, 11 healthcare workers were referred to phone-based support, 5 healthcare workers were referred to a non-employer-associated mental health provider, and 18 healthcare workers received other forms of support (Table 2). *In many cases, a single contact yielded more than one form of mental health support being provided to a healthcare worker (e.g., immediate phone-based crisis support and referral to their employee assistance program).*

Table 2. Outcomes of successful contact by Heroes Health outreach teams. These data represent only a fraction of total impact.

	TOTAL	UNC Chapel Hill	Cooper University	Jefferson University	Appalachian Regional	Grady Health ED	River Valley Behavioral Health	Care Providers of Minnesota	Indiana University	Baystate	St. Joseph Mercy	Marshfield Clinic	Goshen Health
Unique Users Flagged	217	62	12	28	14	23	20	2	0	7	4	11	34
<i>Suicidal ideation</i>	39	11	0	3	2	5	4	0	0	1	0	3	10
<i>High symptom burden</i>	114	35	6	24	5	8	6	1	0	4	2	7	16
<i>Moderate symptom burden</i>	64	16	6	1	7	10	10	1	0	2	2	1	8
Outcomes of Successful Contact													
<i>Supportive Psychotherapy or Problem Solving</i>	44	6	0	20	3	2	10	0	N/A	2	0	0	1
<i>Referral to Employee Assistance Program</i>	36	3	0	7	6	19	1	0	N/A	0	0	0	0
<i>Referral to web or app-based resources</i>	27	9	0	6	6	3	0	0	N/A	3	0	0	0
<i>Referral to institution-associated mental health provider</i>	18	11	0	4	0	1	0	0	N/A	0	1	1	0
<i>Referral to phone-based support</i>	11	4	0	6	0	0	1	0	N/A	0	0	0	0
<i>Referral to mental health provider not associated with institution</i>	5	1	0	4	0	0	0	0	N/A	0	0	0	0
<i>Other support</i>	18	11	0	2	2	0	1	0	N/A	0	0	1	1

5.3. 1,640 Healthcare Workers Enrolled

Among the available sample, 33% of Heroes Health users were nurses (at the LPN, RN, or advanced practice levels), 14% worked in allied health (including case management, mental health, occupational therapy, pharmacy, physical therapy, respiratory therapy, and speech therapy), 10% were physicians (at the intern, resident, or attending levels), 9% were emergency medical technicians (EMTs) or paramedics, 7% worked administrative roles (including accounting, administrative support, administrators, and senior leadership), 21% worked other roles (including environmental services workers, food services workers, information technology professionals, law enforcement or security, medical assistants, nursing assistants, research professionals, and students). Seven percent declined to share their occupation (Figure 15).

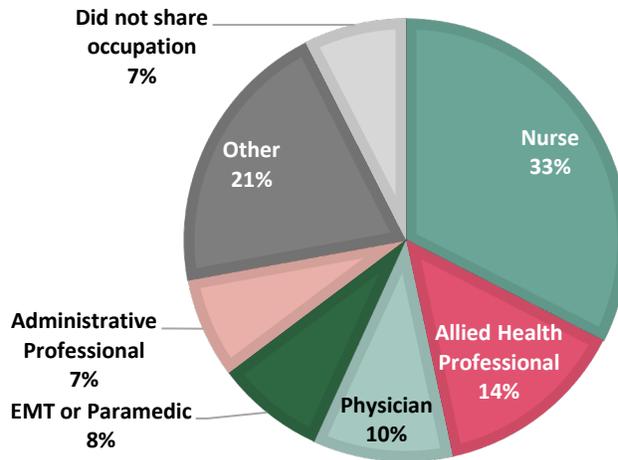


Figure 15. Breakdown of Heroes Health users by occupation.

Among the available sample, Heroes Health users ranged from 18 to 88 years of age, demonstrating Heroes Health’s success in appealing to healthcare workers across generations. The median user age was 41; this aligns with the national median hospital worker age of 42¹ and suggests that Heroes Health enrollment was not biased by age.

Among the available sample/user fraction, women constituted a majority (77%) of Heroes Health users, followed by men (21%) and members of the gender non-binary community (1%). The remaining 1% of users did not share their gender identity (Figure 16). Disproportionately low usership among men may reflect broader barriers to help-seeking among men, who face pressure to conform to stereotypical gender roles.²

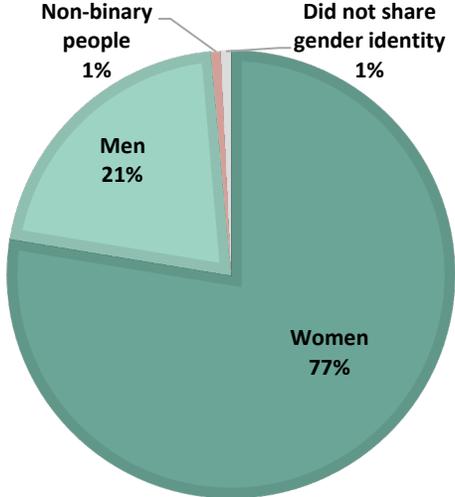


Figure 16. Breakdown of Heroes Health users by gender identity.

Organizational partnerships were an engine for user recruitment, with 486 (29.6% of) users in the available sample fraction affiliating with a partner organization.

Table 3. User demographics by affiliation.

	UNC Chapel Hill	Cooper University	Jefferson University	Appalachian Regional	Grady Health	Care Providers of Minnesota	River Valley Behavioral Health	Indiana University	Baystate	St. Joseph Mercy	Marshfield Clinic	Goshen Health
Affiliated Users	136	34	63	23	59	7	38	0	28	13	23	62
Gender Identity												
<i>Woman</i>	77%	85%	92%	83%	66%	86%	82%	N/A	64%	85%	74%	92%
<i>Man</i>	19%	15%	8%	9%	31%	14%	18%	N/A	36%	15%	26%	8%
<i>Non-binary</i>	2%	0%	0%	0%	2%	0%	0%	N/A	0%	0%	0%	0%
<i>Prefer not to answer</i>	1%	0%	0%	9%	2%	0%	0%	N/A	0%	0%	0%	0%
Occupation												
<i>Nurse</i>	37%	27%	89%	29%	28%	0%	9%	N/A	15%	73%	50%	41%
<i>Allied health professional</i>	13%	8%	0%	10%	11%	14%	47%	N/A	0%	7%	4%	19%
<i>Physician</i>	19%	27%	0%	0%	30%	0%	3%	N/A	75%	7%	4%	0%
<i>EMT or paramedic</i>	3%	0%	0%	0%	0%	0%	0%	N/A	0%	13%	17%	0%
<i>Administrative professional</i>	8%	8%	2%	19%	13%	71%	24%	N/A	5%	0%	4%	6%
<i>Other</i>	19%	31%	9%	43%	17%	14%	18%	N/A	5%	0%	21%	35%

The Heroes Health app retained users at over six times the average for lifestyle apps. Repeated use is a key measure of user satisfaction with lifestyle apps, including Heroes Health. Among users in the user subsample available for analyses by November 2021, 59% completed at least one survey 7 days post-enrollment and 33% completed at least one survey 30 days post-enrollment. Heroes Health’s 7-day and 30-day retention surpasses that of other lifestyle apps by over 6-fold³ (Figure 17).

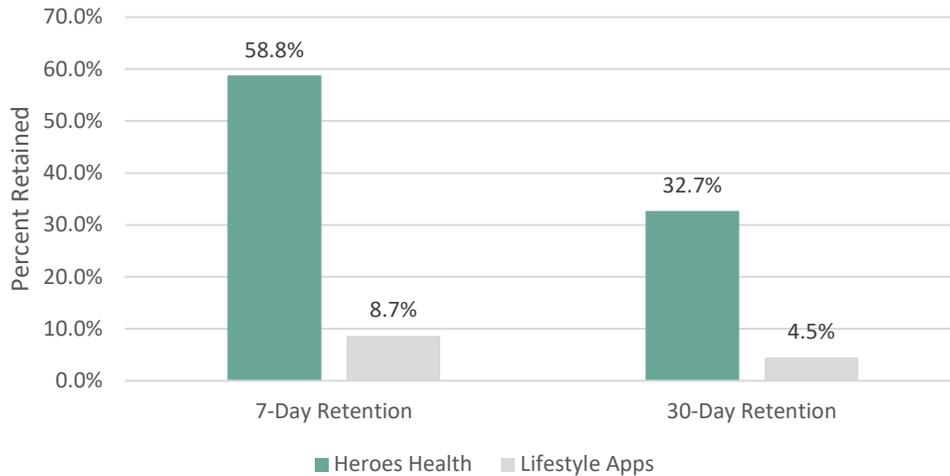


Figure 17. Heroes Health retention compared to other lifestyle apps.

Users who were affiliated with a partner organization were more likely to continue using the Heroes Health app 4 weeks and 6 weeks post-enrollment (Figure 18), suggesting that users at partnering organizations perceive Heroes Health as being more beneficial than those at non-partnering organizations. Users also used the app at times of greatest crisis, to access care, and in this way Heroes Health served its mission.

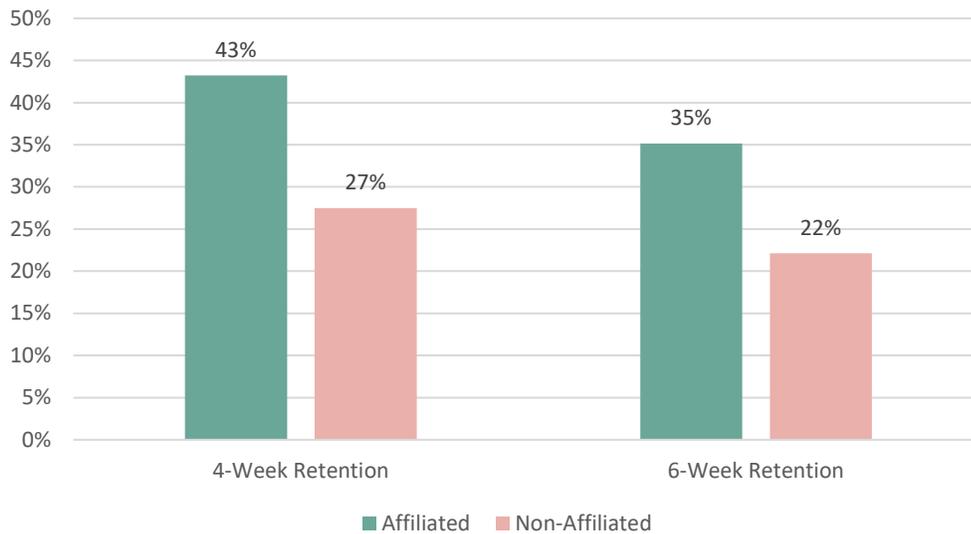


Figure 18. Affiliated users have higher retention rates than unaffiliated users.

6. In Users' Own Words

On an in-app user feedback survey conducted in February 2021, 67% of users affiliated with a partnered organization agreed or strongly agreed with the statement “Using the Heroes Health app has been helpful in supporting my mental well-being” (Figure 19). Healthcare workers at partner institutions found the app more helpful than individual users, suggesting that the mental health outreach and organizational support provided by partnering organizations provides additional benefit and is important for organizational users.

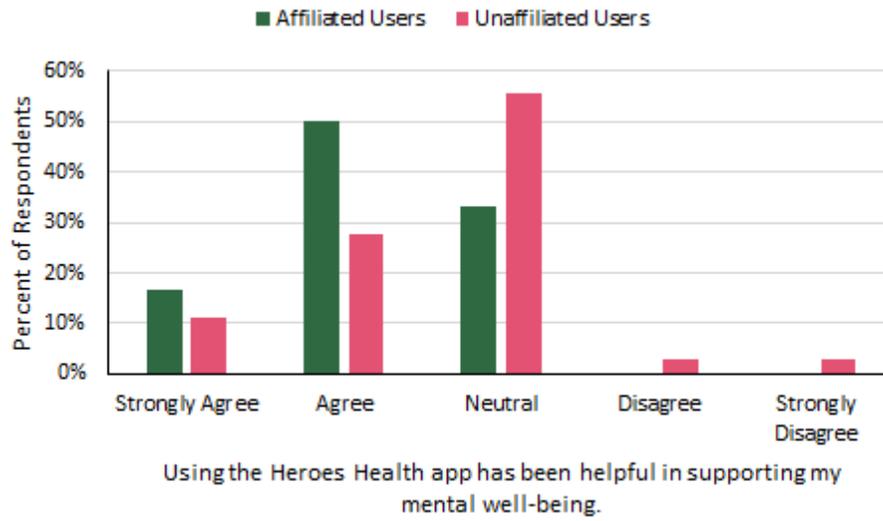


Figure 19. User responses to the question “Using the Heroes Health app has been helpful in supporting my mental well-being”. Sixty seven percent of users at partnering organizations agreed or strongly agreed with this statement.

Participants view the self-assessment as the most helpful feature. The same feedback survey asked participants to select all aspects of Heroes Health they found helpful for maintaining their mental well-being. Most participants chose “Ability to self-assess my mental well-being” as a helpful part of Heroes Health (Figure 20). Participants were also provided the opportunity to record additional responses in free text. Other responses, such as “to know that others feel the same way I do,” suggest that participation in Heroes Health creates a sense of community and support that healthcare workers need.

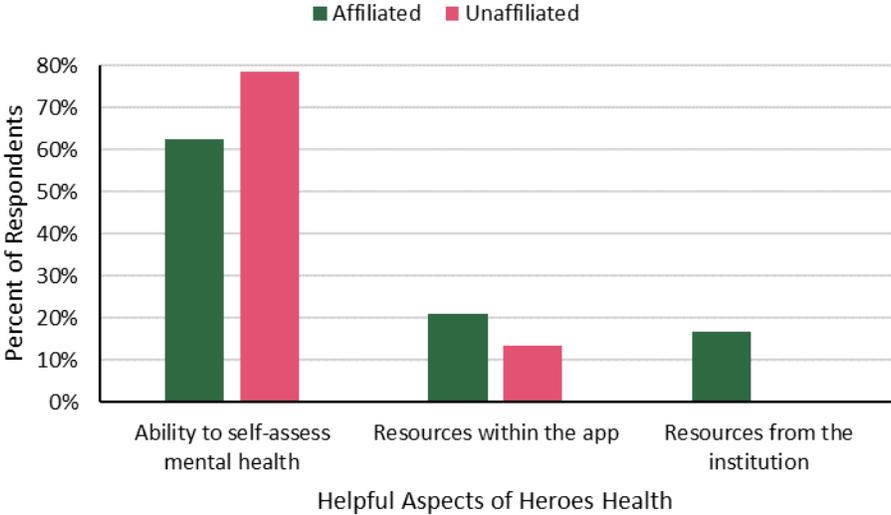


Figure 20. User responses to helpful aspects of Heroes Health. Note that only users affiliated with a partnering institution receive resources within the app from their institution.

7. Appendices

Appendix 1: Resources for Outreach Teams

Below are representative examples from the resource sheet provided to outreach teams by Heroes Health.

Name	Summary	Cost	Format
<u>Anxiety-Related Resources</u>			
<u>Breathe2Relax</u>	App that teaches user breathing techniques to manage stress and anxiety.	Free	App
<u>Sanvello</u>	App teaches deep breathing, behavioral exercise, identifying and addressing negative thinking patterns, and replacing these patterns with positive ones.	Free	App
<u>Depression-Related Resources</u>			
<u>Self-Care Suggestions</u>	Article outlines various recommended activities to relax including: <ul style="list-style-type: none"> • Create a happy/coping playlist • Schedule stretch breaks during work 	Free	Website
<u>MindDoc</u>	Provides an in-the-moment mood assessment over the span of two weeks to assist users in deciding whether to seek professional care.	Free, Optional in-app purchases	App
<u>Sleep Related-Resources</u>			
<u>Pzizz</u>	App for addressing racing thoughts and calming the body into rest.	Free	App
<u>Calm</u>	Most recommended App for sleep, meditation, and relaxation. Provides tools to manage anxiety.	7 Day-Free trial, \$12.99/month	App
<u>Posttraumatic Stress-Related Resources</u>			
<u>Mindfulness Coach</u>	Teaches users how to practice mindfulness through various exercises.	Free	App
<u>About Face</u>	Hear stories from those affected by PTSD and their stories regarding experiences and treatments.	Free	Website/Videos

Appendix 2: Key Insights from Launch, Early Use, and Transition to Marvin

We are fortunate to have had the opportunity to build our capacity for managing app-based interventions through the Heroes Health Initiative. Our team has built upon our key insights, originally presented in our interim report, to document lessons that may benefit future initiatives.

User uptake

- Most "heroes" resist seeking help and are slow to take it even when it is easy to access. This is likely related to stigma attached to healthcare workers seeking help themselves and the sense that untreated stress, anxiety and depression are to be expected in the field.
- At most sites, the launch of the program resulted in rapid adoption and use by healthcare workers.
- Multiple means of disseminating information are needed to gain both individual users and ones at partnering sites (instead of a single "launch").
- Clear support of Heroes Health from high-level leadership helps uptake at partner sites.
- The vast majority of users at partnering organizations agree to share their data with their mental health support team in order to receive the full benefits of the program.
- Transitioning from being a healthcare student to a healthcare care provider is even more challenging during COVID-19 and these early-career workers are prime candidates for Heroes Health participation.
- Among users of the app, it is common for individuals to report high levels of stress, and for stress and other mental health symptoms to adversely impact their ability to function both professionally and personally.

Partnership

- Healthcare organizations consistently recognize that the COVID pandemic has stressed the mental wellbeing of healthcare workers to an unprecedented degree, and there is a strong desire among the leaders of many of these organizations to obtain feedback from their frontline workers and to establish resources to proactively support the mental health of their workers.
- The process of finalizing institutional agreements and obtaining approval from all of the various institutional stakeholders needed for launch generally takes several months. Strong buy-in from upper-level leadership is critical to navigating through this process.
- Heroes Health's status as a research study, while bringing value long-term, introduced obstacles that a simple consumer product deployment would not encounter.
- Continued individual use is greatly supported through institutional partnership.
- Individual and institutional co-ownership of wellness is best.

Outreach

- Healthcare workers with high symptom burdens who received personalized outreach through Heroes Health reported a high degree of satisfaction with the program.
- Facilitating discussion of best practices between outreach teams helps all (partnered) participants.
- Partners find they are linking many people with resources who would not have been contacted without the app.
- Pre-empting an outreach phone call with an email is helpful for successful contact.
- Users valued the app.

App Development

- Feedback from users is critical for improving the support and user experience.

Transferring Program Leadership

- Frequent, transparent updates to partner organizations are essential to maintaining trust while transferring a program from one lead institution to another.
- A leadership transfer serves as an opportunity for innovation.

8. References

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