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Understanding Work-Related Stress among Medicolegal Death Investigators: A National Survey and Mixed-Methods Impact Study

Final Report

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List of Acronyms and Abbreviations

ABMDI	American Board of Medicolegal Death Investigators
COVID-19	coronavirus disease 2019
CS	compassion satisfaction
HRV	heart rate variability
IACME	International Association of Coroners and Medical Examiners
MDI	medicolegal death investigator
MEC	medical examiner or coroner
N/A	not applicable
PTSD	post-traumatic stress disorder
REDCap	Research Electronic Data Capture survey system
SD	standard deviation
STS	secondary traumatic stress
WRAP	Wearables Research Analytics Platform

Executive Summary

Medicolegal death investigators (MDIs) conduct investigations and certify the cause and manner of unnatural and unexplained deaths. They provide services and information that are critical to both public health and criminal legal systems. They also support communities and families, often interacting with individuals who were close to the deceased in some of the most difficult of circumstances. As such, they experience high levels of work-related stress. Yet, relatively little is known about which aspects of work cause the most stress, the short- and long-term impacts, and the kinds of supports and resources needed to address it. RTI International partnered with the American Board of Medicolegal Death Investigators (ABMDI) and the International Association of Coroners and Medical Examiners (IACME) to develop and conduct a two-part research study to address this gap in knowledge and practice. In Phase 1, RTI conducted a national survey, which was fielded among members of ABMDI and United States–based members of IACME. In Phase 2, RTI implemented an impact study in which MDIs used a wellness mobile app specifically designed for MDIs. Self-reported and physiological data were collected at baseline and throughout the duration of the impact study to evaluate the app's effects on health and well-being metrics.

National Survey

The *Understanding Work-Related Stress among Medicolegal Death Professionals* survey was developed in collaboration between the research team and members of ABMDI and IACME. The survey covered MDI-specific stressors, operational stressors, organizational stressors, stress related to coronavirus disease 2019 (COVID-19), health and well-being outcomes, personal and work resources for managing stress, and demographic information. Approximately 1,000 MDIs participated in the survey. Results revealed that top sources of MDIs' stress were the following:

- Aspects of interacting with family members of decedents
- Lack of understanding from political stakeholders and community leaders about their work
- Fatigue
- Staff shortages
- Working more than 24 hours in a row to complete work assignments

Survey data showed that mental health challenges are common among MDIs. One in 10 MDIs reported experiencing moderate to high levels of depression; the same was true for anxiety. Of respondents, 42% reported experiencing depression symptoms some of the time; 35% reported experiencing anxiety symptoms some of the time. About four out of 10 MDIs experienced moderate to high levels of stress related to their employer and the nature of their work, and three out of 10 experienced moderate to high levels of burnout. Respondents reported that COVID-19 exacerbated existing work-related stress.

Overall, MDIs' access to work-based health and wellness resources was limited. The most widely available resource (employer-provided therapy or counseling) was available to less than half of respondents. Of respondents, 18% reported that they did not have access to *any* health and wellness resources at work, and 27% of respondents who had access to employer-provided therapy or counseling use it. Perceptions of effectiveness among those who use it are mixed, with 25% believing it as somewhat effective, 31% viewing it as only slightly or not all effective, and 44% reporting it is very or extremely effective. The work-related resources respondents viewed as most effective for reducing stress are peer support programs, formal mentoring programs, outside gatherings with colleagues, informal gatherings during work time, and informal mentoring.

Impact Study

In the impact study, 55 MDIs provided daily self-report measures and biometric data on work activities, sleep, and stress indicators over a 6-week period. These measures allowed the research team to learn more about the types of activities that trigger stress. The team also tested the effectiveness of MDI Align, a mindfulness and wellness app developed through this project that is tailored to the needs and experiences of MDIs.

Through the daily surveys in MDI Align, participants were asked to report issues and events experienced on each work day. Of the 661 days reported as having a work shift, participants identified stressors or issues every day. The most frequently reported daily issue was fatigue, which was indicated on 56% of recorded surveys, and identified as a challenge by all but one participant. This was followed by working alone (32.5%) and excessive administrative duties (32.4%). Over the duration of the study, participants provided 1,247 self-reports of sleep quality. Participants reported that their sleep over the past 24 hours was of poor quality about one-quarter of the time.

Participation in the impact study (using the mindfulness and wellness content in MDI Align and participating in the data collection activities) led to a significant reduction in self-reported sleep problems and depression, and a significant increase in self-reported coping self-efficacy. Participants also demonstrated a significant decrease in physiological stress, as measured by heart rate variability, compared to the baseline measurement.

Recommendations for Research and Practice

This study was an important step in better understanding the aspects of work that cause the most stress for MDIs and promising strategies for mitigating their impacts. The current study did not allow us to completely disentangle effects attributable to MDI Align content versus daily reflection spurred by the in-app surveys or behavior change resulting from wearing and receiving feedback from a biometric device (i.e., smartwatch). Future research should employ a true experimental design with participants randomly assigned to different conditions to increase knowledge of what works to improve MDI well-being.

The results of this study demonstrated that many causes of MDI stress are outside the factors that many would assume. Policies and practices that examine and improve MDI workload

issues, staffing, and schedules, as well as educate stakeholders (such as public health professionals, political leaders, law enforcement, and community members) about the critical functions MDIs serve would likely reduce their experiences of stress and strain. MDIs viewed as most effective the work-related resources that were social in nature: peer support programs, formal mentoring, outside gatherings, informal gatherings during work time, and informal mentoring. Employers of MDIs should increase provision of and access to socially oriented supports.

MDIs' work can be challenging and even traumatic. Yet, MDIs are generally not only committed to their profession, but they are also passionate about it. The insights gleaned from this project's focus groups, qualitative data collection, and collaboration between the research team and ABMDI and IACME demonstrated that MDIs are incredibly strong and resilient. They are committed to supporting one another and to improving the profession through participation in research studies like this one and through efforts to raise visibility of their roles, needs, challenges, and opportunities.

This important profession has been understudied in the scientific research community and neglected in important policy conversations for far too long. It is imperative that researchers and practitioners continue to partner to identify new ways to better support the MDI community, and to reduce work-related stress in this profession wherever possible.

1. State of Extant Research on MDI Stress

Medicolegal death investigators (MDIs) investigate any death that falls under the jurisdiction of a medical examiner or coroner. This includes all suspicious, violent, unexplained, and unexpected deaths (American Board of Medicolegal Death Investigators, 2023). Employees who directly or indirectly experience traumatic events in the course of their workday are at an increased risk for mental health problems (Brondolo et al., 2012; Coleman et al., 2016; Cummings et al., 2021). In their daily activities, MDIs are exposed to trauma both directly (e.g., through identification of humans, or working mass causality or child fatality scenes) and indirectly (e.g., via speaking with family members of deceased victim, or photographing images of evidence) (Brondolo et al., 2012). Although medical examiners and coroners' (MECs') roles at the intersection of criminal justice and public health systems expose them to highly traumatic environments, only a few select studies have focused on the MDI community. Of these, most have predominately focused on post-traumatic stress disorder (PTSD) and PTSD symptoms (e.g., Brondolo et al., 2018).

The few studies that have examined the impact of stress and trauma on this population more broadly have demonstrated the severity and complexity of work-related stress in the MDI community. For example, Brondolo and colleagues (2012) found that aspects of MEC work present risks for the development of depression, anxiety, and post-traumatic stress symptoms, and that there are variations by job title, with investigators, administrative staff, and coroners reporting the highest levels of symptoms. A later study by the same researcher (Brondolo et al., 2018) began to examine the pathways through which workplace trauma leads to depression and PTSD symptoms, finding that negative cognitions (particularly around alienation from others) mediated the relationship between these exposures and mental health outcomes.

Although this research has been important for beginning to understand the effects of work-related stress on MDIs, it has been limited by its sole reliance on self-report data and failure to examine supports and resources (e.g., workplace trainings, coping skills) that can ameliorate their negative effects. The need for additional research on the impact of stress on the MDI community is particularly important given current trends in their work including daunting caseloads and depleted funding, staffing, and resources due to growing epidemics, such as the opioid crisis and the coronavirus disease 2019 (COVID-19) pandemic (Morrow et al., 2019; Shrestha et al., 2021).

1.1 Occupational Factors Unique to MDIs

The duties of MDIs dictate that they investigate death scenes, examine and take pictures of the deceased, collect relevant samples and evidence, interview family members, friends, and bystanders, prepare initial reports, and deliver information and personal effects to families, among many other tasks. An MDI experiences highly stressful and emotional situations daily with what they see, hear, and document. They are frontline witnesses to distressing and disturbing events, or trauma, that have resulted in death. Because MEC offices are organized in a disparate system of centralized medical examiners, county MECs, mixed county MECs, and

other municipal offices (e.g., district, county, city, and regional), the level of support and funding for health and wellness resources likely varies widely, but little is systematically known given the dearth of research that has focused on MECs in general, and MDIs in particular.

1.2 Importance and Benefits of Addressing Workplace Stress among MDIs

Witnessing the damage resulting from natural or human-caused disasters can cause varying psychological and physical responses among individuals who are exposed to a large number of deceased remains (Benedek et al., 2007, Shalvi et al., 2011). A growing body of literature in other relevant contexts, including law enforcement, medicine, social work, and first responder communities, has demonstrated the impact of work-related stress on employees who interact with victims of trauma. This research has examined how these workers often experience burnout, vicarious trauma (emotional response to empathic engagement with traumatized clients), secondary traumatic stress (STS; i.e., secondary PTSD, characterized by intrusion, re-experiencing, and avoidance), and compassion fatigue (a gradual lessening of compassion over time and lack of satisfaction from helping others), all of which can result from the cumulative effects of shorter-term work-related stress and strain in addition to exposure to traumatic events and situations (Cummings et al., 2021).

Studies of employees in criminal justice and public health systems have found that organizational stressors, such as long work hours, high caseloads, and large numbers of assignments, can further increase stress, with increases and co-occurrence of STS, compassion fatigue, and burnout (e.g., Sprang et al., 2007). These experiences, coupled with repeated exposure to trauma, can have significant impacts on first responders, such as chronic fatigue, substance abuse, depression, and even suicide. These mental and physical problems resulting from work-related stress also have significant effects on organizations. In policing, for example, officer stress has been linked to increased absenteeism (Violanti, 2014), turnover (Reece, 2011), and poorer job performance (Bell et al., 2015). Therefore, it is critical to understand the impact of work-related stress on MDIs, not only to support the health and wellness of individuals in this profession, but also to ensure the health and efficacy of the organizations in which they work.

Workplace stress management programs can be used by organizations to reduce stress; enhance emotional and physical health; measure STS and CS impacts; and to evaluate the adequacy of training and preparation received as ways to counteract the psychological impact of workplace stress. The small number of studies focused on MECs have illustrated that training and opportunities to discuss their experiences can ameliorate the potential negative impacts of work-related stress and trauma on employees' mental health (Coleman et al., 2016).

An individual's ability to recover from and return to mental well-being after a traumatic experience and other high-stress, real-world encounters impacts their long-term negative health outcomes, such as anxiety, substance abuse, sleep problems, and PTSD (McLay et al., 2010). Techniques such as mindfulness meditation and relaxation training have been linked to more positive outcomes, including reductions in stress, anxiety, and depression, and improved work

performance and decreased turnover (Dane & Brummel, 2014; Hourani et al., 2016). Having these well-being tools "at ready" in the form of a mobile application or wearable technologies increases employees' likelihood of utilizing wellness strategies. Wearable monitoring platforms used to track biophysiological data (e.g., heartrate and sleep quality) during relaxation training and high-stress daily activities have shown that relaxation training has improved depression, anxiety, and stress symptoms as well as benefitted those suffering sleep problems due to chronic mental health issues (Hourani et al., 2018; Kim et al., 2019; Kizakevich et al., 2018).

1.3 Research Questions

Through our work with the MDI community and the small body of extant research in this area, we know that this workforce suffers from high levels of stress and burnout, which in turn impact not only their own health and well-being but their ability to effectively conduct their work. Yet, as noted above, significant knowledge gaps remain, hindering the ability of researchers and practitioners to support the well-being of this workforce.

This actionable research will inform future interventions and preventative training to reduce work-related stressors and alleviate their detrimental impact in the MDI workforce. It will also help inform employers on how to improve employee well-being and organizational outcomes, such as improved mental and physical health for employees, less absenteeism and turnover, and improved job performance.

- What is the extent of work-related stress, vicarious trauma, and negative health outcomes among MDIs in the United States?
- What types of stress management and workforce resiliency techniques are currently being used by MEC offices and individual MDIs in the United States?
- What are the operational stressors (i.e., tasks and situations) that are inherent to the job itself that negatively affect health and well-being? (For example, speaking with family members, examining child deaths.)
- What are the organizational stressors (i.e., characteristics of the work environment that affect stress) that negatively affect health and well-being? (For example, lack of supportive leadership/supervision, unmanageable caseload, lack of supportive policies and resources.)
- What characteristics and behaviors buffer against the negative impacts of work-related stressors on health? (For example, workplace trainings and supports, stress-reductions programs, coping skills.)
- To what extent can application-based breathing exercises and mindfulness practices mitigate stresses among MDIs to promote workforce resiliency and readiness?
- How will work-related events and participation in the mindfulness intervention affect participants' physiology, as demonstrated through their heart rate variability (HRV) and physiological sleep data?

1.4 Description of Study Population and Project Partners

RTI International worked in close partnership with the American Board of Medicolegal Death Investigators (ABMDI) and the International Association of Coroners and Medical Examiners (IACME) in all aspects of study design and implementation.

The ABMDI is a voluntary national, not-for-profit, independent professional certification board that has been established to promote the highest standards of practice for MDIs. ABMDI certifies individuals who have the proven knowledge and skills necessary to perform medicolegal death investigations as set forth by the National Institute of Justice (NIJ, 2011). As of 2019, there were 1,836 ABMDI registrants. The IACME represents MECs and has over 1800 members. It is an accrediting agency for medical examiner and coroners' offices within the United States. We used input from ABMDI and IACME stakeholders to inform the content of the national survey, and to recruit participants for both the national survey and impact study. ABMDI leadership estimates that there are approximately 4,000–4,500 MDIs working in the United States.

2. Phase 1: National Survey

2.1 Study Design and Methods

Phase 1 of the project was to develop and implement **Understanding Work-Related Stress among MDIs: A National Survey**. This survey was the first of its kind to examine the breadth and scope of routine exposure to stressful and traumatic events and outcomes in this population. For the purpose of the survey, RTI defined MDIs as a professional having the legal authority to investigate deaths for a medicolegal (MEC) jurisdiction, who perform scene investigations, collects evidence and develops decedents' medical and social histories to assist the MEC in determining the cause and manner of death.

2.1.1 Instrument Development

It was vital to the study that the national survey apprise MEC offices and MDIs on how to better understand and support health and wellness, improve organizational outcomes and personal well-being, and inform future interventions to reduce and alleviate work-related stressors. Therefore, we worked closely with our partners in the MDI community, including those from ABMDI and IACME to help inform the survey instrument content through focus groups.

The research team first drafted a list of potential constructs and corresponding survey scales based on the limited research on MDI stress and the research literature on work-related stress in other high-stress, adjacent professions, such as policing. This draft content was shared with the ABMDI and IACME stakeholders in virtual focus groups. They were asked to speak to any additional elements that are important to understanding MDI stress and to provide context on those already identified.

The 90-minute focus groups were attended by a diverse group of ABMDI and IACME leadership and members. The 14 participants represented a mix of coroners, medical examiners, chief investigators, and medical death investigators across 11 states throughout the United States. Discussion topics included the stressors encountered in the daily working life of members of the MDI community; any stress management strategies that employers or individuals use to mitigate against these stressful events and experiences; experiences with investigating deaths during the COVID-19 pandemic; and feedback on draft survey content.

Table 1 presents summary of the major themes and constructs identified during the focus groups that were utilized in the design of the survey content and questions.

Table 1. Example Focus Group Themes and Constructs

THEME	CONSTRUCT
Operational and organizational stressors encountered	Receiving a lack of support and understanding from supervising body and general public including less support than other types of first responders
	Being provided inadequate paid time off
	Experiencing indefinite understaffing, under resourcing, and underfunding
	Responding to families in difficult times
	Hearing about death by suicide among peers or others in the profession
Effects of work stress on health and well-being	Missing big life events of loved ones due to shift work or being on call
	Developing ineffective or unhealthy coping mechanisms and lack of self-care
	Protecting others creating an inability to talk with family or friends about work
	Experiencing lack of sleep
Barriers to addressing stress at work	Receiving lack of supervisor support and understanding
	Having to use sick time or paid time off to see a counselor
	Needing to console counselors or therapists whom they sought help from due to their inability to understand an MDI's job
	Receiving no stress mitigation resources

After the focus groups, we obtained additional written input from our partners in the MDI community, including those from ABMDI, IACME, and also the National Association of Medical Examiners to ensure the national survey included the breadth of topics they felt was adequate to assess the varying stressors MDIs experience in their work. The resulting national survey included work-related constructs such as job-specific and life-specific stressors, case-specific exposure stressors, stress management barriers, MDI-specific stressors, and organizational and operational stress. We also assessed health-specific stressors such as burnout, compassion fatigue, sleep quality, anxiety, depression, and PTSD symptoms. Finally, we assessed participants self-improvement or coping experiences such as mindfulness, coping self-efficacy, work stress, and personal stress management resources, and general non-identifying demographics. We also assessed to what extent these stressors and experiences had been exacerbated by the COVID-19 pandemic.

The national survey held a targeted time limit of 15–30 minutes. Participants provided consent electronically before beginning the survey. The survey was intended to be completed in one sitting, but respondents had the opportunity to save and return to the survey at a later point. The survey was completed in the Research Electronic Data Capture survey system (REDCap), a free, secure online data collection platform. As a member of the REDCap consortium, RTI maintains an internal, HIPAA-compliant, REDCap survey system for data collection. The system is secure, protected, and data are frequently backed up into the Azure cloud-based storage system. For a full list of measures implemented in the national survey, see **Appendix A**.

2.1.2 Survey Implementation Plan

A data collection outreach plan was developed to obtain a response rate of at least 60%, ensure data completeness and accuracy, and minimize respondent burden across the 16-week period that the survey was in the field. Reflecting survey best practices, the cadence of the reminders was designed to promote the survey at a pace that was not bothersome to message recipients and comes from different parties, with varied content so that the messages are reinforced without being stale.

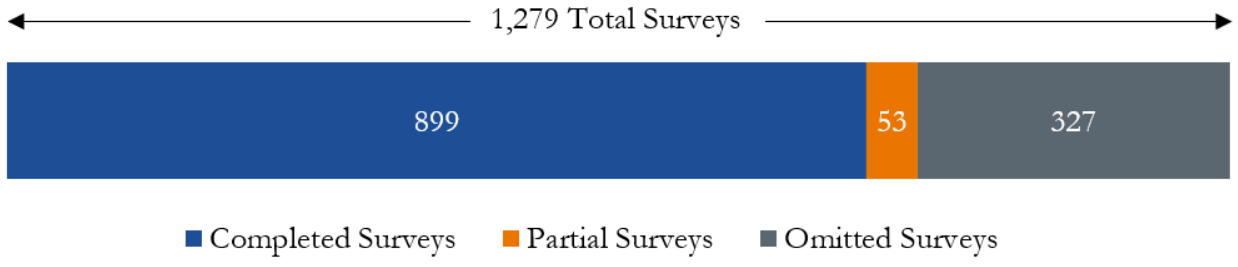
Project partners ABMDI and IACME sent out the pre-survey notice and subsequent reminders on behalf of the study team, allowing us access to the study population to introduce the overall study to the field, describe the study goals and importance, emphasize the survey was voluntary, request survey participation, and increase legitimacy and gain buy-in by highlighting ABMDI and IACME's involvement. Following the pre-survey notice, the ABMDI and IACME sent follow-up e-blasts, included the survey in their organizations' newsletters, and disseminated announcements at their professional meetings or symposia. A study announcement was also made at the 2021 National Association of Medical Examiners professional meeting. RTI also recruited participants for the survey through the project website (https://forensicrti.org/understanding-work-related-stress-MDI-professionals/), as well as through the Forensic Technology Center of Excellence, Center for Policing Research and Investigative Science, and RTI Forensic Ed newsletters. Each reminder was developed with the aim of reinforcing the importance and voluntary nature of the study and providing participants with a link to the web survey. The informed consent process ensured the anonymity of prospective participants.

2.2 Results

2.2.1 Survey Responses

Between April 12 and August 9, 2021, we received 1,279 survey responses from MDIs across the country (**Figure 1**). Surveys were omitted from the study sample based on completion status and the extent of missing values. Of the 1,279 surveys, 899 were fully completed and included in the final sample. An additional 53 surveys were partially completed and contained enough information to contribute to our understanding of the top occupational stressors. These surveys are excluded from subsequent analyses due to missing information.

Figure 1. Survey Breakdown



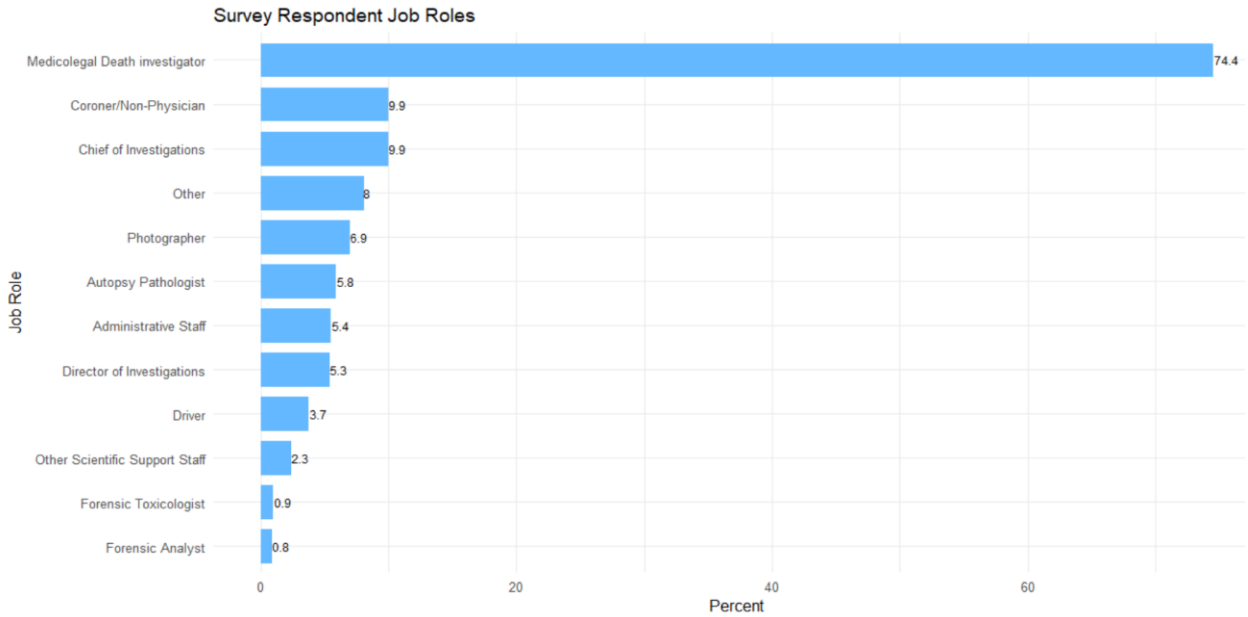
Due to the sampling strategy of open dissemination through multiple channels, including ABMDI, IACME, and National Association of Medical Examiners, and the overlap in membership between these organizations, it is difficult to estimate the true sampling frame and response rate of the survey. Based on ABMDI alone, whose 1,836 registrants represent 50% of the MDI workforce, surveys were completed by about 49% of members and about 25% of the total MDI workforce. We believe the survey results effectively approximate the target population and reflect the experiences of MDIs across the country.

2.2.2 Participant Characteristics

The figures below detail the demographic breakdown of the study sample. Overall, a majority of the study identify as white (79.9%) and female (63.8%). Most respondents fall within the 35–44 age category. The sample was educationally diverse, with more than two-thirds possessing a bachelor's degree.

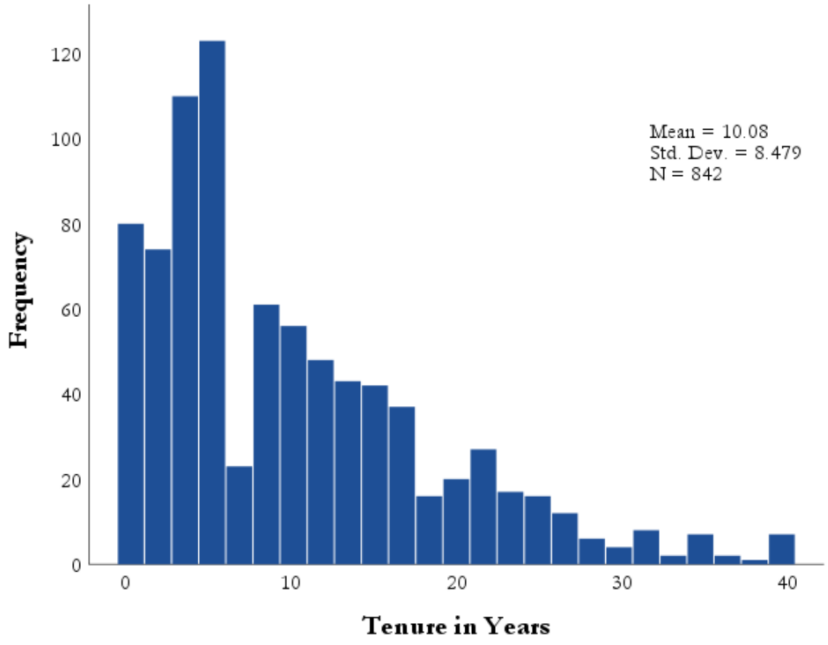
As expected, a majority of respondents identify their job role as MDI (74.4%). Coroners, investigators, and technicians are also represented in the survey, detailed in **Figure 2** below. The "other" category of job roles consists largely of autopsy technicians and assistants, forensic technicians, and medical examiner assistants.

Figure 2. Job Role Distribution



Beyond variability in job role, a full range of job tenures are represented in the sample, ranging from less than a year to 40 or more years in the field (**Figure 3**). The average tenure of the sample was approximately 10 years. The median caseload for each respondent was about 15 cases per week.

Figure 3. Job Tenure Distribution

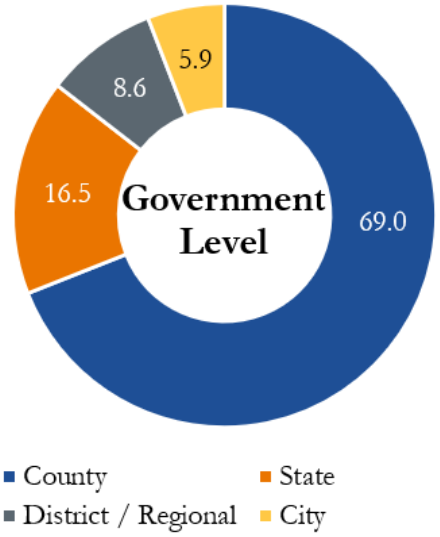


The respondents represent agencies from more than 350 jurisdictions in 49 states plus DC and Puerto Rico, that served all levels of government. A majority of respondents operated at the county level (64.2%) followed by state, regional, and city offices. The type of agency and level of government are reflected in **Table 2** and **Figure 4** below. These agencies most frequently reported to the county level government (31.1%), public health agencies (26.1%), or reported to no other agencies (i.e., were independent; 17.9%).

Table 2. Agency Type Distribution

Description of Office	*n* (*N* = 899)	%
County Medical Examiner Office	283	31.5
County Coroner Office	269	29.9
State Medical Examiner Office	137	15.2
District/Regional Medical Examiner Office	80	8.9
City Medical Examiner Office	38	4.2
Private Autopsy Facility	10	1.1
District/Regional Coroner Office	5	0.6
None of the Above	16	1.8
Missing	61	6.8

Figure 4. Government Level



These agencies perform a wide range of responsibilities (reflected in **Table 3** below). The most common responsibilities were assisting medical examiners in death investigations (76.3%) and determining the cause and manner of death (75.3%). Only 2.2% of respondents reported working for agencies that execute arrest warrants and serve process.

Table 3. Agency Responsibilities

Responsibility	*n*	%
Assist medical examiners in death investigations	686	76.3
Determine the cause and manner of death	677	75.3
Move the decedent from location of death	573	63.7
Order toxicology testing	510	56.7
Conduct inquests	408	45.4
Execute arrest warrants and serve process	20	2.2
None of the above	7	0.8

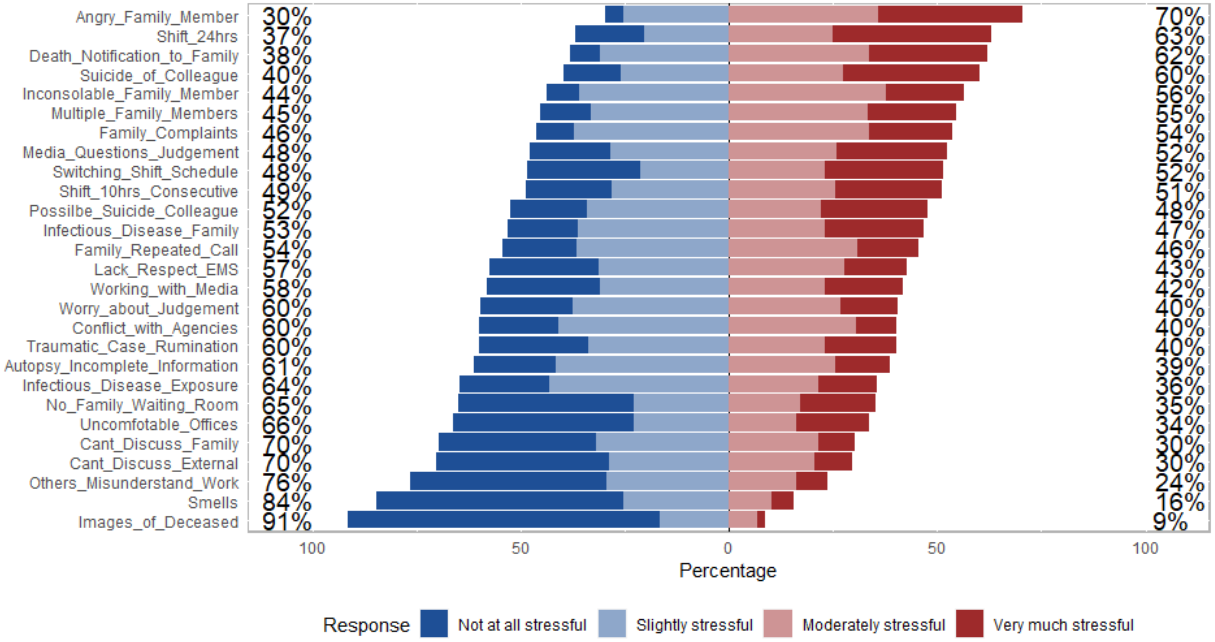
2.2.3 Key Descriptive Findings on MDI Stress, Health, and Wellness

Stress

The job-specific stress scale consists of 26 items related to the specific occupational conditions of working as an MDI. **Figure 5** breaks down how stressful respondents found each of the stressors on a scale of 1–7. The items related to dealing with the family of the deceased—including interacting with aggressive family members (70%), death notifications (62%), and interacting with inconsolable family members (56%)—are consistently rated among the most stressful. Almost two-thirds (63%) of respondents rated working more than 24 hours in a row as

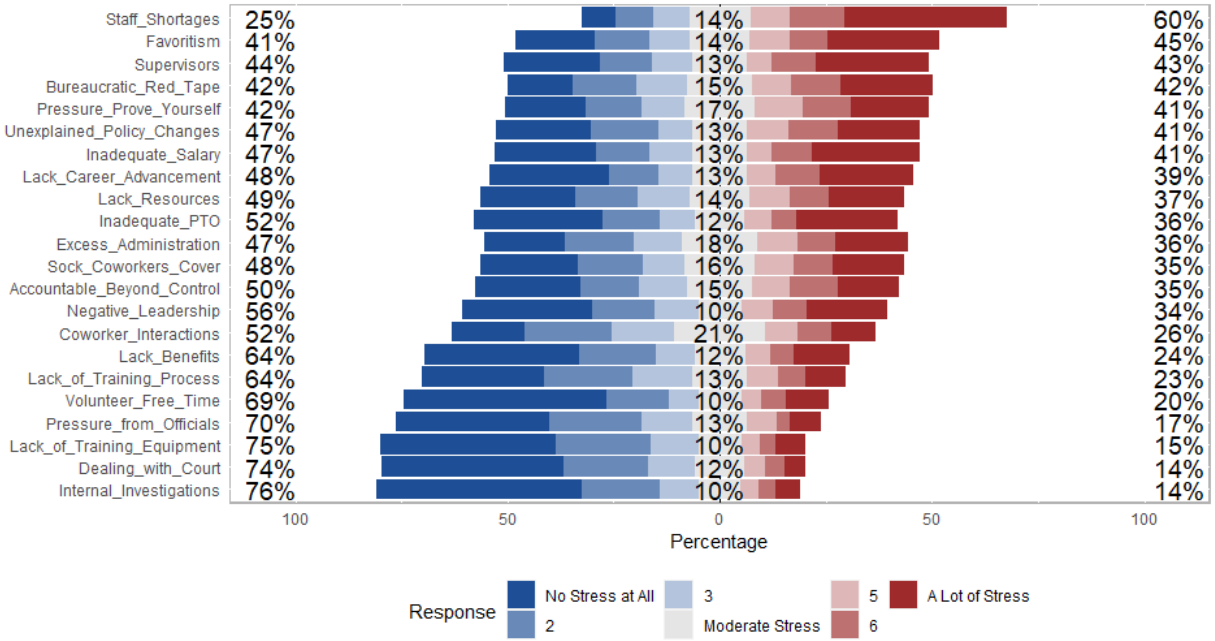
stressful and this may contribute to the related issues of sleep quality and exhaustion described later. Although relatively rare, 60% of respondents mentioned being stressed by the suicide of a colleague, which further highlights the need for health and wellness resources among this population. The images and smells associated with the MDI profession were ranked as the least stressful.

Figure 5. Job-Specific Stress Likert Summary



The organizational stress scale consists of 21 items related to the organizational environment and conditions. **Figure 6** presents a breakdown of how stressful respondents found each of the organizational stressors. By far, the largest organizational stressor is staff shortages, which likely compounds the effects of other stressors related to shift schedule, burnout, and fatigue. Factor analysis identified the next three stressors—favoritism, dealing with supervisors, and bureaucratic red tape—as part of the single strongest factor of administrative complaints. Accountability items such as internal investigations and internal pressure were rated among the least stressful items.

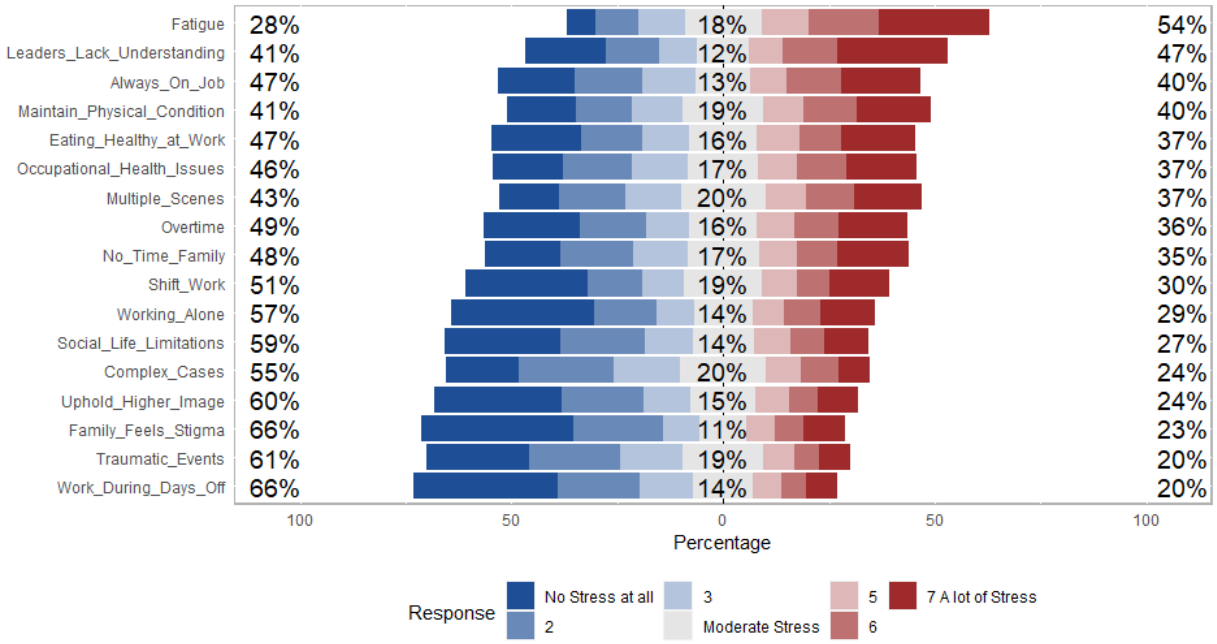
Figure 6. Organizational Stress Likert Summary



The operational stress scale consists of 17 stressors related to managing the profession. **Figure 7** presents a breakdown of how stressful respondents found each operational stress item. While factor analysis was not feasible with this number of items, the top stressors appear to be related to managing health behaviors in the context of work: fatigue (54%), staying in shape (40%), and eating healthy (37%). Respondents also express frustration about the lack of understanding from political stakeholders or community leaders about the work. This however does not translate to high stress about stigma of their job or limitations to social life. The

feeling of always being on the job is also ranked as stressful, though the operations stressors as a whole were perceived as less stressful than the job-specific or organizational stress scales.

Figure 7. Operational Stress Likert Summary



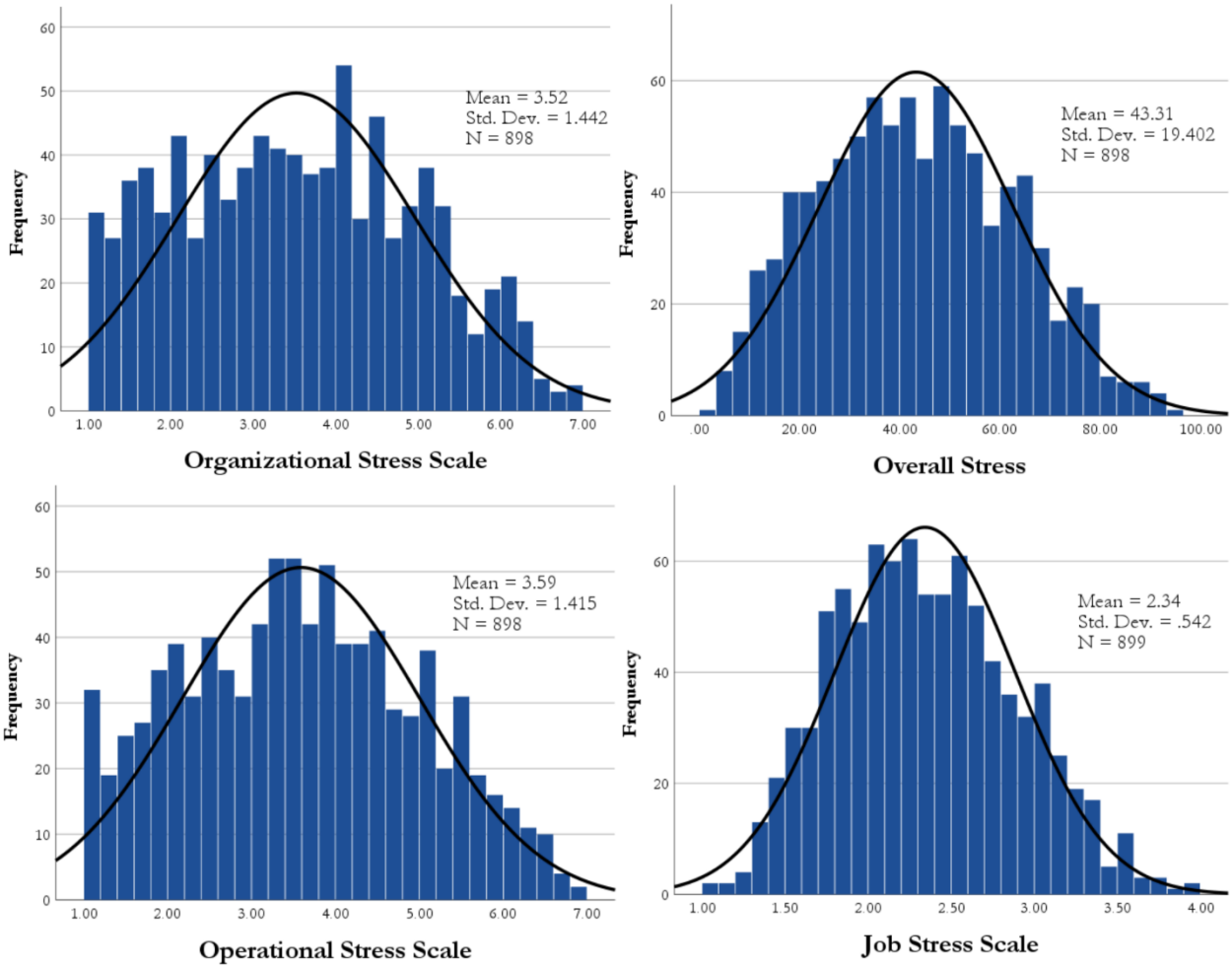
We also consider the levels of stress across individuals for each of the stress scales, as well as provide a summary measure of stress in **Figure 8**. The job-specific stress scale has high internal consistency with a Cronbach's α of 0.923 and is measured from 1 (low stress) to 4 (high stress). The distribution of job-specific stress among respondents was normally distributed, with a mean of 2.34 (standard deviation [SD] = .54), indicating that 12% of respondents were between moderately and very stressed.

The organizational stress scale has high internal consistency with a Cronbach's α of 0.946 and was measured from 1 (low stress) to 7 (high stress). The distribution of job-specific stress among respondents was fairly normally distributed, with a mean of 3.52 (SD = 1.44), indicating that 38.5% of respondents were between moderately and very stressed.

The operational stress scale had high internal consistency with a Cronbach's α of 0.932 and is measured from 1 (low stress) to 7 (high stress). The distribution of job-specific stress among respondents is normally distributed, with a mean of 3.59 (SD = 1.42) and is similar to the organizational stress scale distribution.

The total stress scale distribution reflected in Figure 8 aggregates the job-specific, organizational, and operational stress for each respondent and is scaled to measure stress between 0 and 100. As with its component scales, overall stress is normally and evenly distributed among respondents, with very few reporting either no or extreme levels of stress.

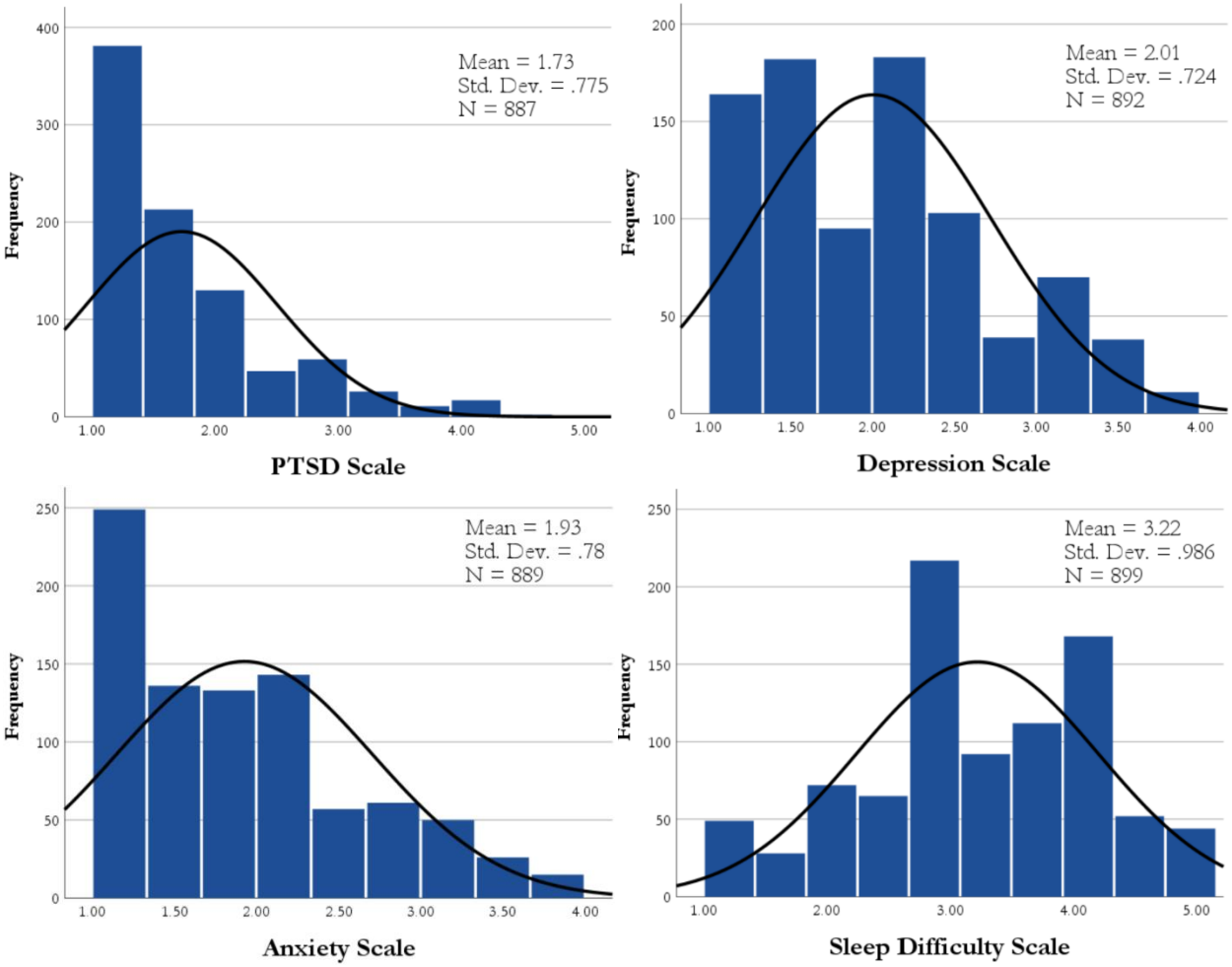
Figure 8. Stress Scale Distributions



Health and Wellness Indicators

The survey measured a number of health outcomes related to the stress and operational conditions of working as an MDI. **Figure 9** below is a matrix of histogram distributions of the health scales: sleep quality, depression, anxiety, and PTSD.

Figure 9. Health Outcome Distributions



The **sleep quality** scale (Cronbach's α: 0.855) is an index of three questions examining difficulty falling asleep, difficulty staying asleep, and an overall rating of sleep quality ranging from 1 (no difficulty with sleep) to 5 (high difficulty with sleep). The sample had a mean score of 3.22 (SD = .986), indicating that over half of the population had difficulty with sleep. Nearly 32% of the participants reported poor or very poor sleep quality.

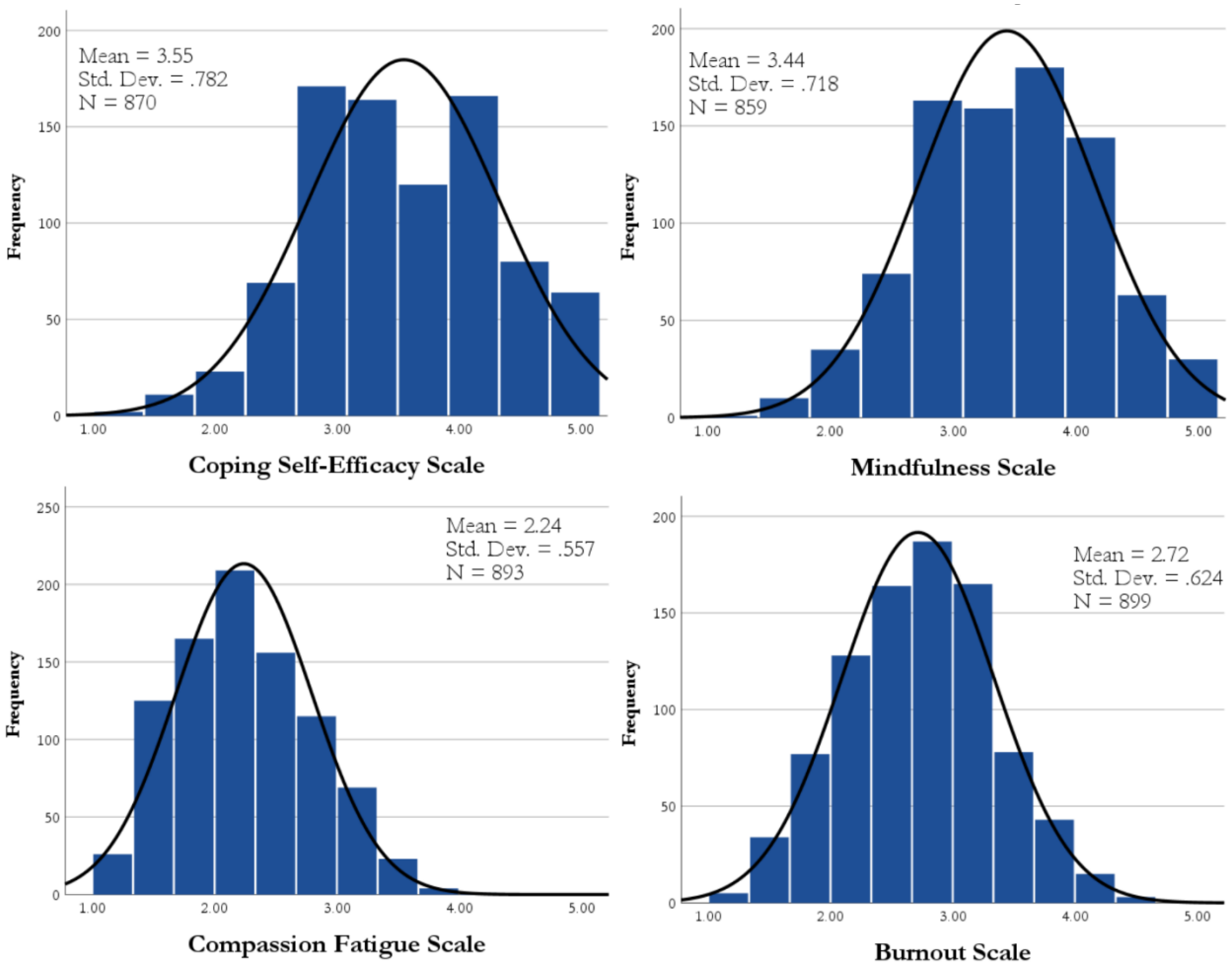
The **depression** scale (Cronbach's α: 0.825) is an index measure of five questions examining depression, sleep difficulty, loneliness, and trouble with motivation, ranging from 1 (low depression) to 4 (high depression). The sample had a mean score of 2.01 (SD = .724), with most of the sample scoring low on the depression scale. Of respondents, 10% reported moderate or high levels of depression. This was largely driven by the question on sleep quality, a known issue for this population.

The **anxiety** scale (Cronbach's α: 0.919) is an index measure of seven questions examining nervousness, difficulty relaxing, restlessness, and irritability, ranging from 1 (low anxiety) to 4 (high anxiety). The sample had a mean score of 1.93 (SD = .78), with the sample heavily skewed toward low anxiety. Of respondents, 10% reported moderate or high levels of anxiety.

The **PTSD** scale (Cronbach's α: 0.890) is an index measure of four questions examining reliving past trauma, avoidance of stimuli, and isolation, ranging from 1 (low PTSD) to 5 (high PTSD). The sample had a mean score of 1.73 (SD = .775), with the sample heavily skewed toward low PTSD. 6.4% of respondents reported moderate or high levels of PTSD.

Additionally, the survey included measures of MDI outlook. **Figure 10** below is a matrix of histogram distributions of the outlook scales including burnout, compassion fatigue, perception of coping self-efficacy, and mindfulness.

Figure 10. Wellness Outcome Distributions



The **burnout** scale (Cronbach's α: 0.890) is an index of 21 questions examining work fatigue, strain, frustration, and perceptions of accomplishment ranging from 1 (low burnout) to 5 (high burnout). The sample had a mean score of 2.71 (SD = .624), and normally distributed, with a majority of respondents experiencing a moderate level of burnout. Higher levels of burnout were driven largely feeling fatigue at the end of the day and apprehension about the following day of work.

The **compassion fatigue** scale (Cronbach's α: 0.897) is an index of 25 questions examining job enjoyment, fatigue, self-actualization, and satisfaction helping others ranging from 1 (low compassion fatigue) to 5 (high compassion fatigue). The sample had a mean score of 2.23 (SD = .557) and was slightly skewed toward the population not having high compassion fatigue. Fewer than 7% of respondents exceeded the median scale value of 3, indicating very little extreme compassion fatigue. While most respondents reported satisfaction being able to help others, compassion fatigue is largely driven by overwhelming caseloads.

The **coping self-efficacy** scale (Cronbach's α: 0.912) is an index of 12 questions measuring problem-solving, rumination, and help-seeking behavior ranging from 1 (low self-efficacy) to 5 (high self-efficacy). The sample had a mean score of 3.55 (SD = .782), indicating that most respondents reported higher levels of coping self-efficacy. At the item level, respondents reported a strong ability to break down problems, but the reliance on others (friends and coworkers) was lower. Only 2.4% of respondents reported a critically low level of coping self-efficacy (2 or lower).

The **mindfulness** scale (Cronbach's α: 0.907) is an index of 13 questions measuring mindfulness and awareness of one's thoughts and actions, ranging from 1 (low mindfulness) to 5 (high mindfulness). The sample had a mean score of 3.44 (SD = .718), indicating a high level of mindfulness among respondents. Only 10% of respondents were below the median scale value of 3, which conveys low mindfulness.

Stress Management Resources

The survey measured access to and utilization of work-based stress management resources. To account for the potential change in resource availability during the survey period in responses to COVID-19, we measure access to the resources currently and pre-COVID-19. **Table 4** describes the percentage of respondents with access to each stress resource. Counseling is by far the most widely available resource, with 47.3% of respondents reporting access. Access to counseling also saw one of the largest increases in availability during COVID-19, made newly available to 14.2% of respondents. Conversely, and as expected, colleague gatherings declined during COVID-19. Of the resources, formal mentoring was available to the fewest respondents (7.9%).

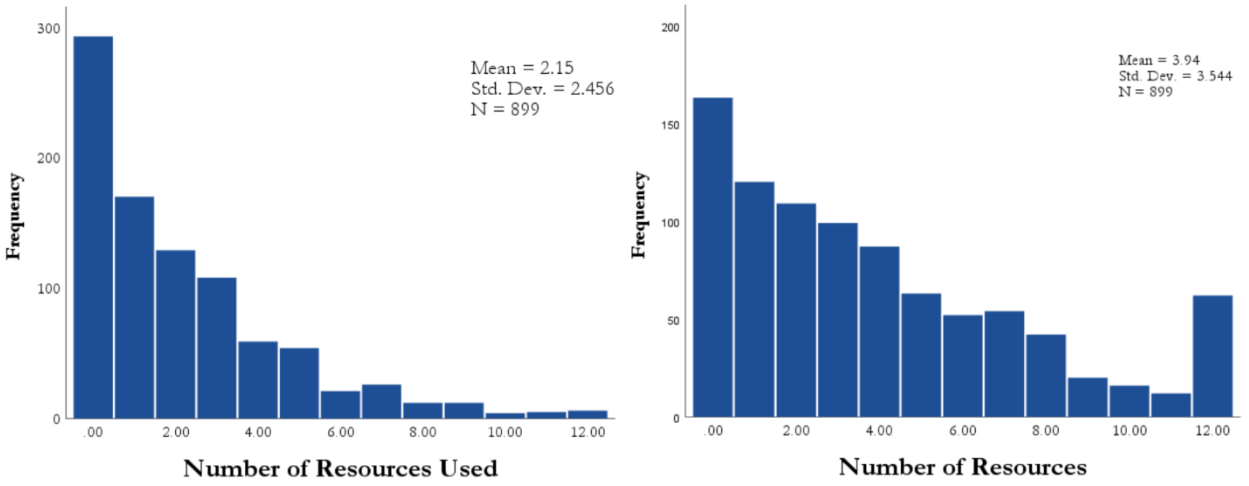
Table 4. Work Resource Availability

Work Resource	Pre-COVID-19	Current	% Change
Counseling	33.1	47.3	+14.2%
Informal Gatherings	33.5	33.6	+0.1%
Stress/Mental Health Management	21.4	32.5	+11.1%
Well-being Training	21.9	28.0	+6.1%
Sharing Accomplishments	18.5	26.5	+8.0%
Critical Incident Debriefing	18.9	24.5	+5.6%
Exercise	18.1	20.4	+2.3%

Work Resource	Pre-COVID-19	Current	% Change
Colleague Gatherings	29.6	18.8	-10.8%
Mindfulness Training	14.8	16.9	+2.1%
Informal Mentoring	11.1	16.7	+5.6%
Peer Support Program	10.9	16.0	+5.1%
Formal Mentoring	7.5	7.9	+0.4%

Of the 12 measured resources, the mean number of programs accessible to respondents, both pre-COVID-19 and current was 3.94 (SD = 3.54). A total of 18.1% (*n* = 163) of respondents have access to zero work resources, while 6.9% (*n* = 62) had access to all 12 work resources. The full distribution is reflected in **Figure 11**.

Figure 11. Work Resource Utilization



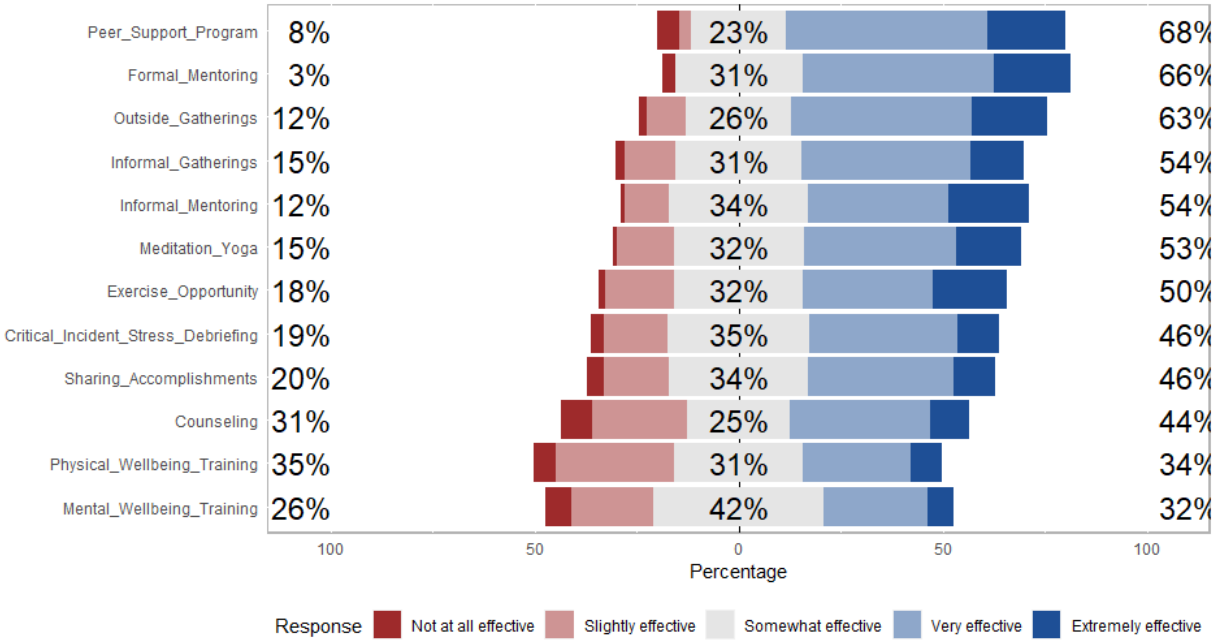
We are also interested in the utilization of these available resources. Figure 11 above shows the distribution of how many resources each participant utilized, with a mean value of 2.15 programs (SD = 2.46). Of those who have access to one or more work resources, 17.7% used none of the available resources. Conversely, 22.6% used all resources available to them. An additional 12.9% of respondents used half of the available resources. The utilization rate of each work resource among those with access and all MDIs is described in **Table 5** below. Peer activities such as gatherings and sharing accomplishments were among the most utilized resources. Despite being the most widely available, counseling and therapy were only used by 26.8% of MDIs for whom it is available. This may be related to perceptions of the effectiveness of these resources described in **Figure 12** below. Counseling was viewed as very or extremely effective by 44% of respondents who used that resource.

Table 5. Work Resource Utilization Rates

Work Resource	MDIs with Access (%)	All MDIs (%)

Informal Gatherings	91.2	45.8
Outside Gatherings	84.2	32.7
Sharing Accomplishments	68.7	21.7
Critical Incident Stress Debriefing	57.8	14.2
Informal Mentoring	57.2	11.5
Exercise	50.0	14.2
Mental Well-being Training	49.6	19.4
Physical Well-being Training	46.1	16.4
Meditation & Yoga Training	44.5	10.5
Peer Support Program	43.4	8.2
Formal Mentoring	32.0	3.6
Counseling & Therapy	26.8	14.2

Figure 12. Effectiveness Ratings of Work Resources



In addition to work-based stress reduction resources, the survey also asked about non-work approaches to mitigating stress. **Table 6** shows the percentage of question respondents who engaged in these activities. Because these activities were wholly elective, the evaluations of their effectiveness skewed heavily toward all of them being at least 70% very or extremely effective. The two exceptions are zoning out (e.g., watching TV) and alcohol consumption, which are viewed as ineffective by 10% and 22% of those who engage in them respectively.

Table 6. Non-work Resource Utilization

Non-work Resource	% Use
Hobbies	87.0
Zoning Out (TV, etc.)	84.1
Travel	81.8
Physical Exercise	80.8
Family Support	73.4
Friend Support	70.6
Socializing with Friends	66.5
Learning New Skill	59.3
Reducing Media	53.1
Alcohol	53.1
Meditation, Yoga, Mindfulness	46.3
Avoiding Triggering News	45.4
Therapy & Counseling	36.6
Religious or Community Groups	34.1
Volunteering	33.5

Key Exploratory Findings on MDI Stress, Health, and Wellness

Bivariate Relationships

Beyond the examination of individual scales, we are interested in the relationships between the measures in the survey. **Table 7** presents a correlation matrix between all of the scales in the survey and allow us to understand directional relationships between stress and participants' health and wellness outcomes. Although no causal interpretations are inferred, these findings can paint a richer description of the concurrent effects of stress and health on the MDI population. It is important to caution that the widespread significance of these bivariate correlations may be attributed to the large sample size, due to which even small relationships may be highlighted as statistically significant. However, the magnitude of these correlations is descriptive to the substantive way in which these scales correlate. One important finding to highlight is the strong positive correlation between all of the stress scales. All relationships were in the anticipated direction. Stress was highly correlated with health and wellness issues. The only negative correlations present were with the positive outlook scales of coping self-efficacy and mindfulness, which negatively correlated with the stress scales, negative outlook, and health issues.

Table 7. Scale Correlation Matrix

Scale	Mean (SD)	1	2	3	4	5	6	7	8	9	10	11
Job Stress	2.34 (0.54)	1										
Org Stress	3.53 (1.44)	.541**	1									
Oper. Stress	3.59 (1.41)	.692**	.755**	1								
COVID-19 Stress	3.13 (1.43)	.598**	.711**	.711**	1							
Sleep Issues	3.22 (0.98)	.382**	.385**	.515**	.361**	1						
Burnout	2.72 (0.62)	.486**	.615**	.646**	.504**	.433**	1					
Compassion	2.24 (0.56)	.403**	.513**	.545**	.398**	.396**	.828**	1				
Depression	2.01 (0.72)	.404**	.475**	.555**	.381**	.631**	.593**	.616**	1			
Anxiety	1.93 (0.78)	.442**	.487**	.542**	.409**	.502**	.616**	.619**	.737**	1		
PTSD	1.73 (0.78)	.435**	.432**	.511**	.364**	.417**	.566**	.600**	.696**	.750**	1	
Self-Efficacy	3.55 (0.78)	-.326**	-.345**	-.393**	-.272**	-.330**	-.557**	-.611**	-.539**	-.537**	-.485**	1
Mindfulness	4.44 (0.72)	-.377**	-.391**	-.457**	-.358**	-.393**	-.566**	-.530**	-.620**	-.615**	-.579**	.455**

* $p < .05$ ** $p < 01$.

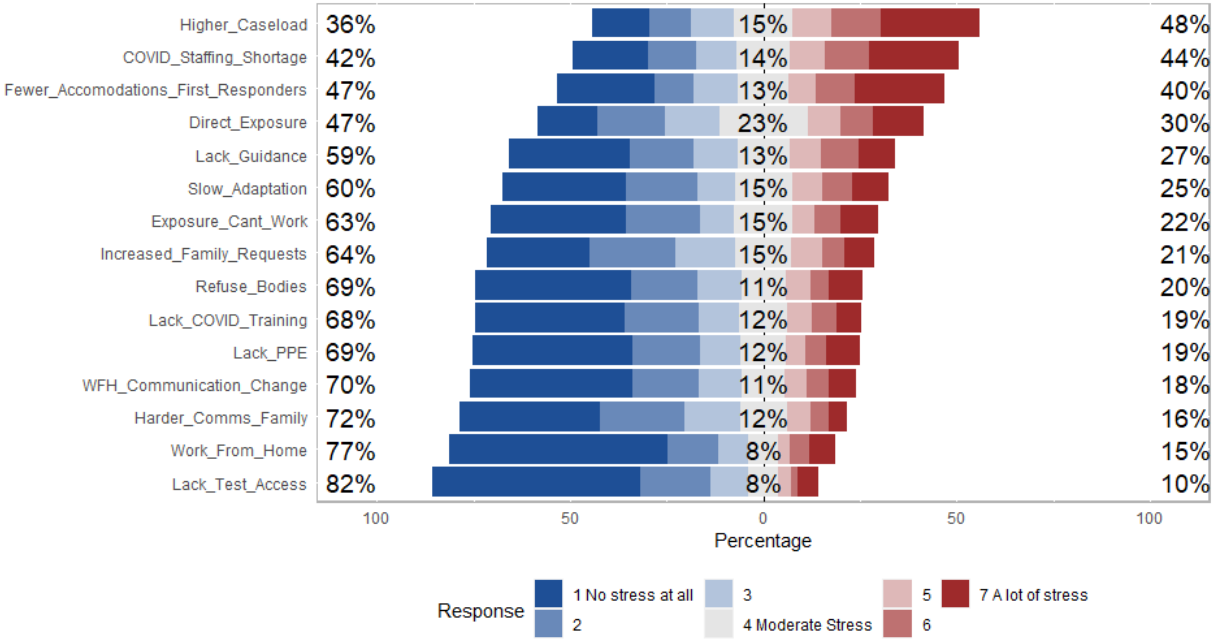
Effects of COVID-19

The survey collection period took place during the COVID-19 pandemic, which could be particularly impactful for the field and for the experiences of the respondents. As such, we included an additional stress scale measuring 15 items related to pandemic stressors (Cronbach's α = 0.933; see **Figure 13**). Overall, respondents reported lower levels of stress about COVID-19 than the other stress scales, and the top stressors were mainly focused on operational constraints such as higher caseload, staffing shortages, and fewer accommodations.

We also included supplemental questions for the other stress scales to capture the role of the pandemic in shaping their responses. About 20% of respondents indicate that this organizational and operational stress responses were impacted by COVID-19. However, around 40% indicated that their job-specific stress ratings were at least somewhat attributed to the pandemic. Specifically, it increased stress about: being exposed to infectious disease (26.3%), bringing home disease to family (28.7%), family complaints about investigations (11.0%), and working over-10-hour days consecutively (9.3%). 15% of respondents indicated COVID-19 was

at least somewhat responsible for their burnout scale responses. This was driven by feeling depleted at the end of the day, with 9% of respondents indicating an increase. The pandemic had a self-reported effect on responses to compassion fatigue (7.4%), depression (14.2%), anxiety (14.2%), and PTSD (12.0%).

Figure 13. COVID-19 Stress Likert Summary



4.3 Stress and Demographics

To provide additional contextual information, we also explore whether the measures of stress varied by key demographics. **Table 8** summarizes statistically significant differences in job-specific stress, organizational stress, operational stress, and COVID-19 stress by gender, race, age range, education level, and the government level of the agency. Due to sample size limitations in certain categories, gender was measured as a binary measure of men or women. While not ideal for identifying heterogeneity in the experiences of different racial groups, race is collapsed into two categories, white and people of color.

Table 8. Trends in Stress Measures across Demographics

	Job Stress	Organizational Stress	Operational Stress	COVID-19 Stress
Gender	Women have significantly higher stress than men	Women have significantly higher stress than men	Women have significantly higher stress than men	Women have significantly higher stress than men
Race	No significant differences	White people have lower stress than respondents of color	No significant differences	No significant differences
Age	As age range goes up, stress decreases	As age range goes up, stress decreases	As age range goes up, stress decreases	As age range goes up, stress decreases
Education	No significant differences	Higher levels of education associated with higher stress	Higher levels of education associated with higher stress	Higher levels of education associated with higher stress
Government Level	City-level MDIs are significantly more stressed than state-level MDIs	No significant differences	City-level MDIs are significantly more stressed than state-level MDIs	City-level MDIs are significantly more stressed than state level MDIs

This analysis identifies a few key trends. Across all measures of stress, female respondents reported higher levels of stress than male respondents. The differences between white respondents and respondents of color were smaller, with white respondents consistently reporting lower stress than respondents of color, but this was only significant for organizational stress. Age had a consistent relationship with stress across all measures, with less stress as age increases. The one exception is the youngest age group (18–24 years), which was lower than those just above it, and more similar to the 45–54 age group. As education categories increased, so too did stress levels, with the exception of the highest educated group having a slight decrease in stress. Due to the categorical nature, the relationship between government level and stress highlighted the pairwise significant differences. Overall, city-level MDIs reported the highest levels of stress, which was significantly higher than the state-level respondents, who reported the lowest stress.

Agency Type, Resource Access, and Stress

It is unlikely that all agency types across the county had equal access to the 12 stress reduction resources measured in the survey. We looked at resource availability across region of the country and by agency government level to estimate any disparity in access to these resources. **Figure 14** compares the average number of resources respondents have access to across four regions of the country. The respondents do not reflect a representative sample of all agencies or individuals in these regions, but each region provides enough respondents for some initial insight. Overall, the comparison across regions is not significant ($F = 1.61$, $p = 0.187$), however the respondents in the West reported significantly more access to resources than those in the Northeast. **Figure 15** looks at resource access across the government level of the agency. The

overall model of mean differences is significant (F = 2.86, *p* = 0.036), with respondents in city offices having access to greater number of resources than other agency types, and state-level respondents having the lowest access. This follows a similar pattern to the stress levels of respondents by agency type as described in **Figure 14**.

Figure 14. Resource Access by Country Region

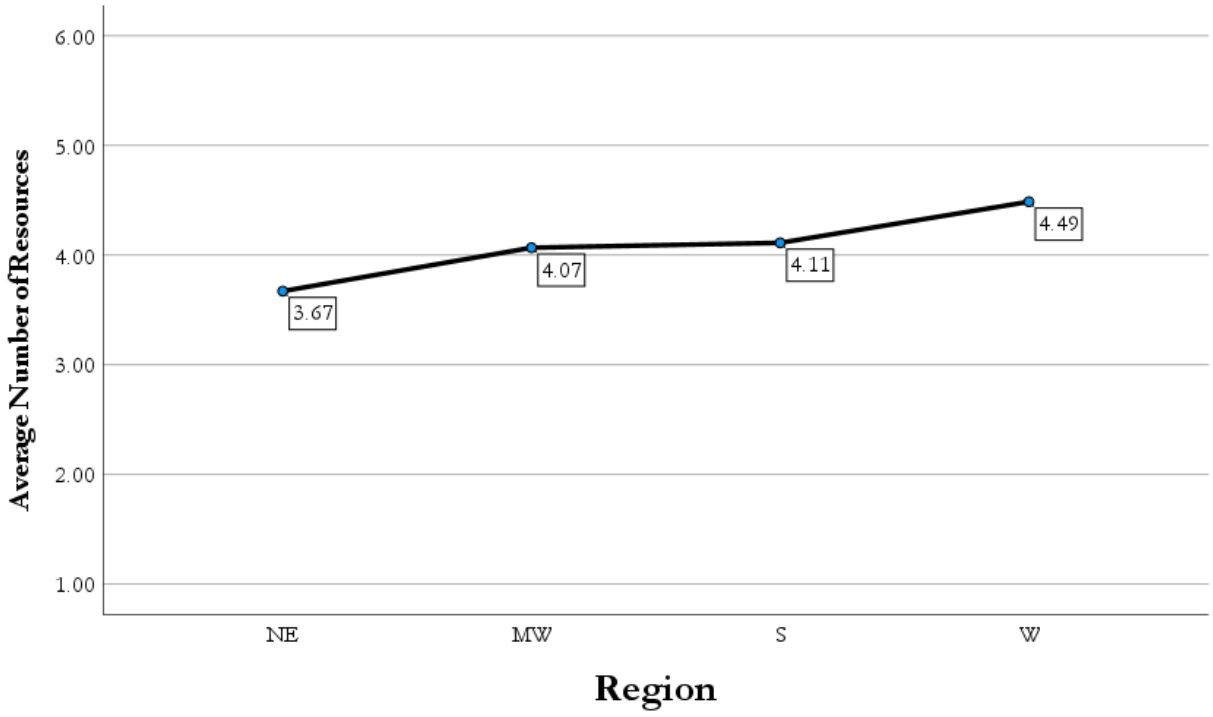
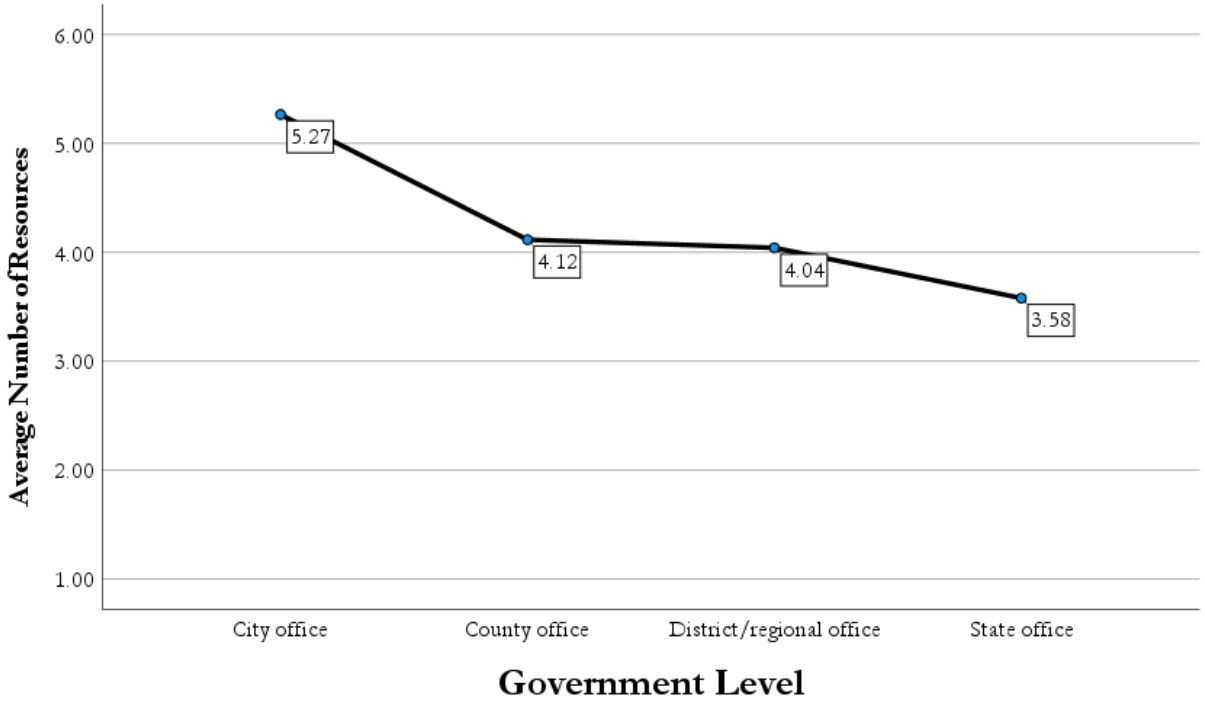


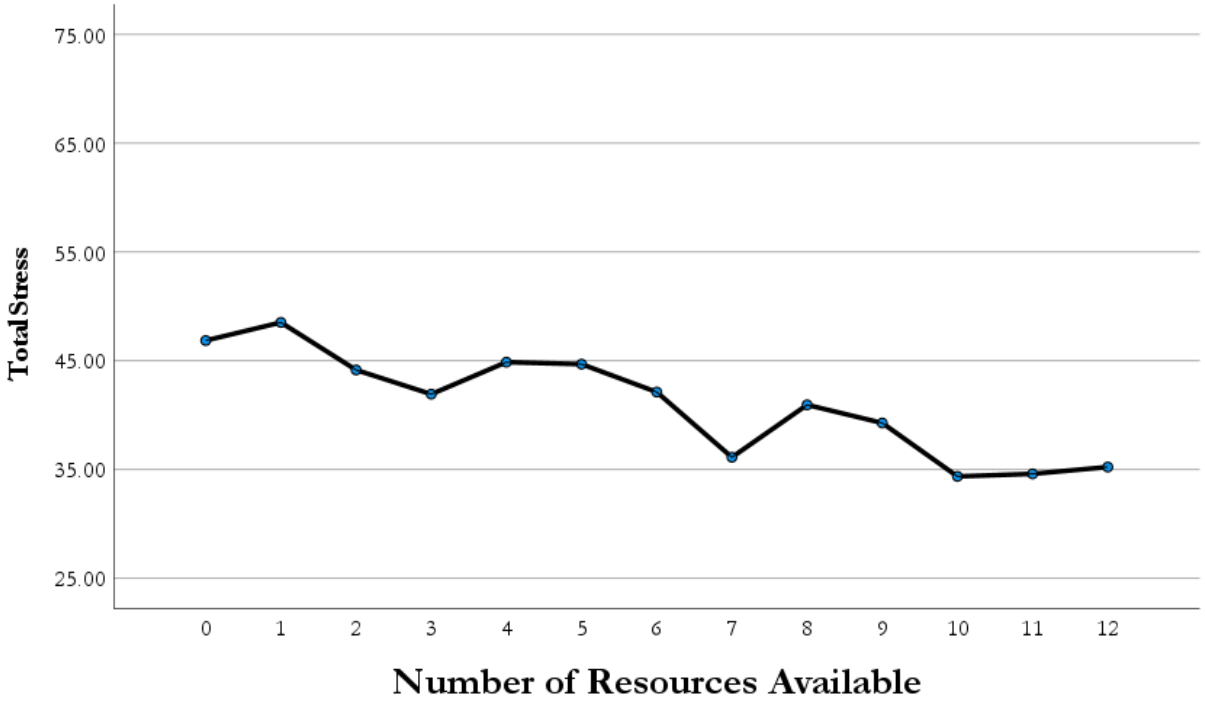
Figure 15. Resource Access by Government Level



Although no causal inference can be inferred, there was a strong, statistically significant relationship between access to stress resources at work and the levels of overall stress ($F = 34.22$, $p < 0.001$). *Access to each additional stress resource is associated with a 1.05% reduction in total reported stress level.* This relationship is demonstrated in **Figure 16**. Looking beyond availability to the number of resources actually used, a similar pattern emerges, with

higher utilization associated with lower stress. Each additional stress reduction resource used is associated with a 1.17% reduction in total stress (F = 20.0, $p < 0.001$).

Figure 16. Stress and Available Resources



Qualitative Analysis

We included one open-ended question at the end of the survey: "What else would you like to tell us about work-related stress in your profession that we haven't already covered?" We conducted a thematic analysis using NVivo software to identify common themes. The top five categories of stressors shared in the open-ended responses were the following:

- Lack of management or coworker support
- Lack of understanding of what their work entails from the government or other administrating agency
- Inadequate staffing or other resources
- Lack of mental health support and mental health resources within one's agency
- Being underpaid

Other stressors reported included lack of cooperation from community partners; additional aspects of stress related to COVID-19; the impact of having a second job; public misunderstanding of MDIs' job duties; shift work; and lack of one's own understanding of job duties prior to taking the position.

2.3 Conclusion

2.3.1 Stress

The three stress scales—job-specific, organizational, and operational—show the specific individual stressors that are of most concern for the MDI population. Many of the top job-specific stressors were related to interactions, particularly negative interactions, with family members of the deceased. Over half of respondents find inconsolable or angry family members as well as notification of kin to be major stressors. The realities of shift work demanded upon MDIs also present a great deal of stress. Shifts lasting 24 hours are common enough to be a stressor for 63% of respondents, and the unpredictability of shifts and multiple consecutive shifts are also large stressors. It is important to note that the suicide of colleagues was reported as moderately to very stressful for 60% of respondents and highlights the need for further health and wellness resources in this population.

Organizational stress does not appear to be quite as prevalent as the job-specific stressors; however, by far the largest organizational stressor was staff shortages, which likely compounds the effects of other stressors related to shift schedule, burnout, and fatigue. Administrative complaints, such as favoritism, dealing with supervisors, and bureaucratic red tape, are also reported as common organizational stressors. The top operational stressors appear to be related to managing health behaviors in the context of work: fatigue (54%), staying in shape (40%), and eating healthy (37%). Respondents also express frustration about the lack of understanding from political stakeholders or community leaders about the work.

Creating a composite measure of stress utilizing all three scales was helpful in characterizing the levels of stress experienced among individual respondents. All measures of stress were highly positively correlated. This overall stress measure is normally distributed with a mean of 43.3 on a scale from 0 to 100, indicating moderate stress as a norm for MDIs, with few individuals on the extreme ends of the spectrum.

Importantly, some measures of stress were experienced differently by different classes of respondents. Across all measures of stress, female respondents reported higher levels of stress than male respondents. The differences between white and non-white respondents were smaller, but white respondents consistently reported lower stress than non-white respondents, although this was only significant for organizational stress. Age had a consistent relationship with stress across all measures, with less stress as age increased. The one exception was the youngest (18–24) age group, which was lower than groups just above it, and more similar to the 45–54 age group. As education categories increased, so too did stress levels, with the exception of the highest educated group having a slight decrease in stress.

2.3.2 Health and Wellness Indicators

While not intended to serve any diagnostic or clinical purpose, the measures of health and wellness problems provide meaningful insight into the experiences of the MDI population. Overall, the population skewed low on scores for PTSD, depression, and anxiety, however these are important issues for the minority of respondents who scored high on these scales.

One consistently observed issue among respondents is sleep difficulty. Likely tied to the realities of shift work expressed throughout the survey, nearly one-third of all respondents reported poor or very poor sleep quality, which can have cascading effects for overall wellness. These negative health measures are all positively correlated with each other, pointing to clustering of negative health outcomes, and positively correlated with the measures of stress.

Wellness outcomes such as burnout, compassion fatigue, coping self-efficacy, and mindfulness can provide insight into the bidirectional relationship between stress and workplace outlook. While no causal inference can be drawn from this methodology, the anticipated effect of high mindfulness and high degree of coping self-efficacy is a limit on stress and the negative effects of stress. This is observed as negative correlations with stress and negative health outcomes. Respondents' coping and mindfulness are normally distributed but are on the higher end, with less than 10% reporting below the median value of mindfulness and 2.4% reporting a critically low level of coping self-efficacy (2 or lower on a scale of 1-5). Similarly, fewer than 7% of respondents exceeded the median scale value of 3, indicating very little extreme compassion fatigue. While most respondents reported satisfaction being able to help others, compassion fatigue is largely driven by overwhelming caseload. Conversely, a majority of respondents reported at least moderate burnout, driven largely by feeling fatigue at the end of the day and apprehension about the following day of work.

2.3.3 Stress Management Resources

The survey measured access to and use of work-based stress management resources. To account for the potential change in resource availability during the survey period in responses to COVID-19, we measured access to the resources at the time of the survey and pre-COVID-19. Counseling was by far the most widely available resource, with 47.3% of respondents reporting access. Access to counseling also saw one of the largest increases in availability during COVID-19, made newly available to 14.2% of respondents. Conversely, and as expected, colleague gatherings declined during COVID-19. Formal mentoring was the least available resource (reported by 7.9% of respondents). Of the measured resources, more respondents had access to only about four of all resources, with nearly one-fifth of MDIs have access to no work stress reduction resources.

Even when MDIs had access to resources, that did not mean they used them to the highest extent. Of those with access to one or more work resources, 17.7% use none of the available resources. Peer activities such as gatherings and sharing accomplishments were among the most used resources. Despite being the most widely available, counseling and therapy were only used by 26.8% of MDIs for whom it was available. This may be related to perceptions of the effectiveness of these resources, which favor peer interactions and cast skepticism on wellness training and counseling. We looked at resource availability across region of the country and by agency government level to estimate any disparity in access to these resources. Overall, the comparison across regions is not significant, however the respondents in the West reported significantly more access to resources than those in the Northeast. When comparing

government levels, respondents in city offices had access to more resources than those at other agency types, and state-level respondents had the lowest access.

While no causal inference can be inferred, there was a strong, statistically significant relationship between access to stress resources at work and the levels of overall stress. Looking beyond availability at the number of resources actually used, a similar pattern emerges, with higher utilization associated with lower stress. These findings in sum point to a need for more widespread access to stress reduction resources, as well as awareness and acceptance of counseling and wellness trainings as effective resources for managing the high levels of stress observed in this population.

3. Phase 2: Impact Study

3.1 Study Design and Methods

The impact portion of this study entailed MDIs' engagement with MDI Align, a mindfulness and wellness app designed specifically for MDIs. Impact study participants also answered daily and weekly questions about work, sleep, and stress, and provided physiological data on sleep and stress through use of wearable biometric devices (i.e., smartwatches).

RTI partnered with an external North Carolina–based mobile application developer, Big Pixel, to create a bespoke mobile app for the intervention component of the impact study. RTI and Big Pixel worked together to develop the application from development to launch and included all mindfulness and wellness content for the intervention. The app, called MDI Align, consisted of all the daily and weekly surveys (with built in push notification reminders directly to users' smart phones), videos, audio files, and general health tips and recommendations, along with more specific health guidance on sleep hygiene. Participants were also provided with a Garmin smartwatch to gather their physiological data during the intervention. The existing Garmin Connect app collected sleep data from participants' Garmin biometric readings, and the proprietary RTI-developed Wearables Research Analytics Platform (WRAP) app was utilized to gather high fidelity HRV data from participants' Garmin biometric readings. The MDI Align app connected to the other two apps and used push notifications to remind participants to sync their Garmin device with the other two apps at least once daily.

Figures 17–20 contain sample screen shots from MDI Align.

Figure 17. MDI Align Splash Page and Welcome Screen

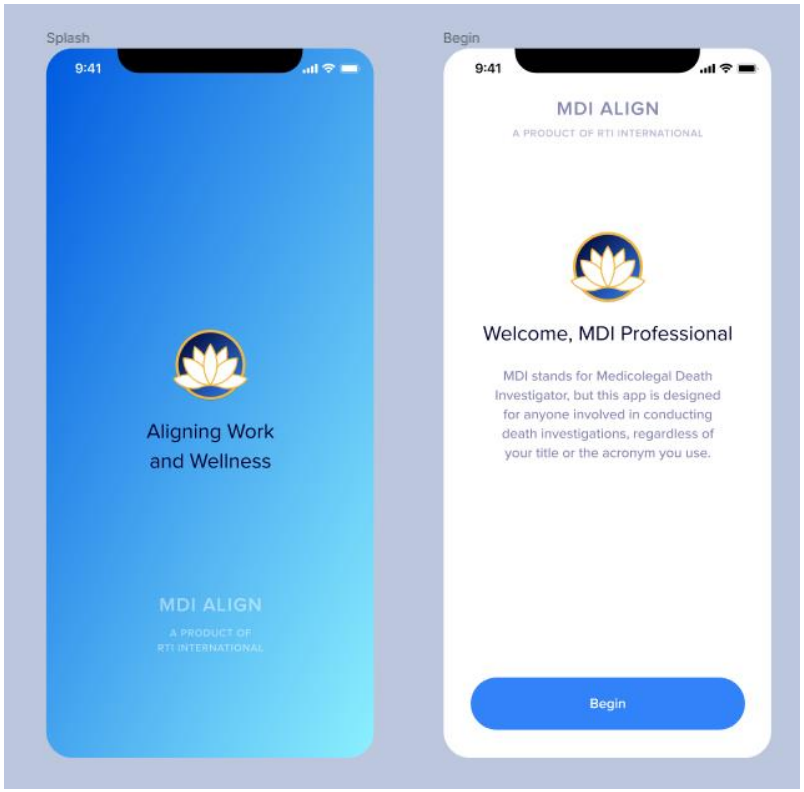


Figure 18. Example Daily Surveys on MDI Align

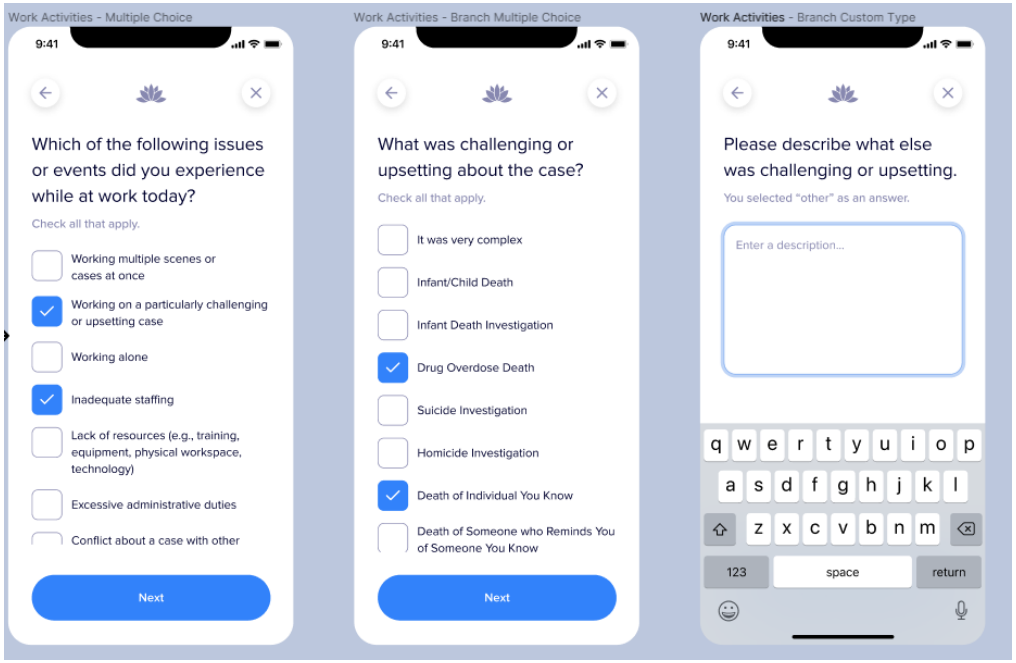


Figure 19. Example Wellness Tips from MDI Align

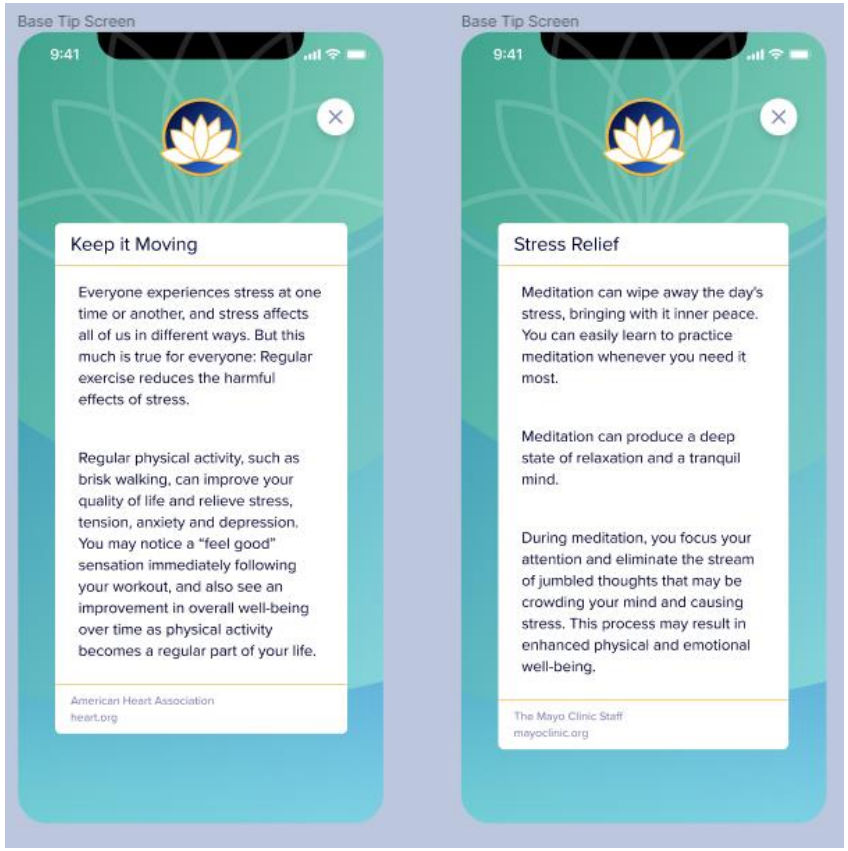
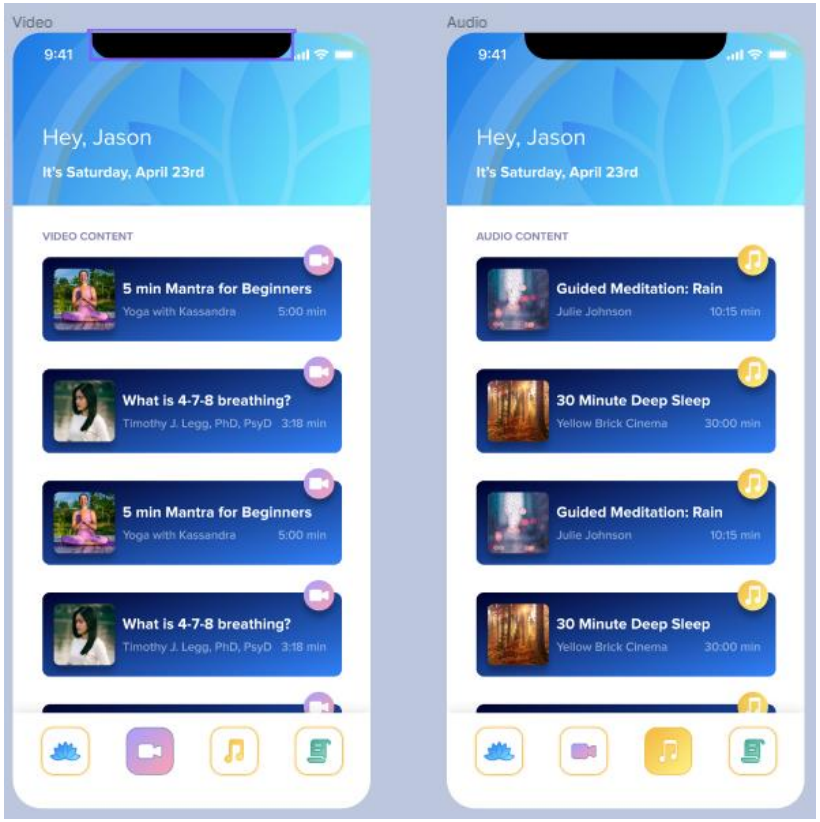


Figure 20. Meditation and Relaxing Sounds Audio Files on MDI Align



3.1.1 Pilot Testing

RTI held a pilot study in the summer of 2022 to test MDI Align and VivoSmart biometric process, prior to the main impact study in the fall of 2022. The pilot study took place over a period of 4 weeks with 10 participants. During the intervention, the RTI study team collected both self-report and physiological measurements on work experiences, stress, and health. Participants signed an electronic consent form and completed a baseline pre-intervention survey in REDCap before the start of the study. The baseline survey was a shortened version of the national survey implemented in Phase 1 (see **Appendix B** for survey measures). Participants next completed 2 weeks of baseline daily and weekly surveys (while wearing a study-provided Garmin VivoSmart 4 biometric device daily), then 2 additional weeks of continued daily and weekly surveys and biometric readings while interacting with the mindfulness and wellness content in the MDI Align app. The daily and weekly surveys asked participants about the stress they experienced that day (at work and at home), and how they slept the night (or previous sleep period) before. Finally, participants completed a post-intervention survey at the conclusion of the pilot study. After the conclusion of the pilot study, the study participants met and discussed suggested potential improvements to MDI Align app and study protocol in two separate focus groups of five participants each.

Based on pilot participants' input, four changes were made to MDI Align and the study protocol before the study. First, the research team decided to use Garmin Vivoactive 4 devices, not VivoSmart devices as originally planned. The reason for this is that the Vivoactive devices have longer battery life, are easier to charge, have a larger, easier-to-read display, and are better for capturing sleep among individuals with inconsistent sleep schedules. Second, based on pilot participant preferences for shorter videos, some of the original videos were broken up into multiple videos. Third, the window in which participants could input daily data was extended to better accommodate busy and varying work schedules. Finally, additional health and wellness tips were added to the app, based on pilot participant request. Pilot participants had specifically requested more tips related to coping with shiftwork and sleep issues.

After revisions to the application, the research team recruited 55 participants to take part in the main impact study in fall 2022.

3.1.2 Final Impact Study Protocol

The main study largely mimicked the pilot study but lasted for 2 additional weeks. Similar to the pilot study, participants signed an electronic consent form and completed a baseline pre-intervention survey in REDCap before the start of the study. Impact study participants next completed 2 weeks of baseline daily and weekly surveys (while wearing a study-provided Garmin Vivoactive 4 biometric device daily), then 4 additional weeks of continued daily and weekly surveys and biometric readings while interacting with the mindfulness and wellness content. Finally, participants completed a post-intervention survey at the conclusion of the main impact study. For a full listing of daily and weekly survey measures implemented in the MDI Align app, see **Appendix C**.

The intervention protocol presented a series of meditations, beginning with basic attention to the breath before adding the body scan and advancing to other meditations. Each day, participants interacted with the app to complete their surveys, and to engage with the mindfulness and wellness content of their choosing. Content included narrated mindfulness audio meditations lasting 10 to 20 minutes, videos created by medicolegal death professionals regarding stress, health, and best practices for a healthy life in this field, as well as tips for health, wellness, and stress reduction with an MDI perspective. For a full listing of all mindfulness and wellness content implemented in the impact study, see **Appendix D**.

3.1.3 Participant Outreach/Recruitment

RTI utilized our partner organizations, ABMDI and IACME, to assist in recruitment for the pilot study and for the main intervention study. RTI's partner organizations sent emails to their organization listserv's and included project recruitment information in quarterly newsletters to constituents. Participants emailed a project email inbox to express interest in participation.

3.2 Study Implementation

Interested participants were emailed an online screener to gauge their availability, commitment, and professional stature (the study was only focused on MDIs in the United States). Participants who met the requirements of the study were then sent an electronic consent form detailing the upcoming survey, app interaction, and biometric components of the study. Once participants signed the consent form, they were mailed a physical packet of onboarding and training materials along with their biometric device (i.e., Garmin Vivoactive 4). Participants used the onboarding materials to guide them through set-up of their device and downloading the three required apps for participation: MDI Align, Garmin Connect, and WRAP.

After completing the baseline survey, participants began a 2-week baseline period of survey and biometric data collection. Participants were instructed to complete daily surveys and once weekly surveys, as well as wear their biometric device as much as possible (barring interaction with water and a need to charge the device). After the initial 2-week baseline period, participants began interacting with the mindfulness and wellness content in the app, which was automatically released after the initial 2-week baseline period. Half (50%) of the mindfulness and wellness content was released at that time point. Participants were instructed to watch videos, listen to audio, and read about healthy living and stress reduction. After an additional 2 weeks (4 weeks into the intervention), the remaining 50% of the content was released to study participants. The content was released in this phased fashion to maintain participant engagement over the period of the study, per Big Pixel's recommendation. Participants used the final 2 weeks of the study to interact with the full library of mindfulness and wellness content. The intervention ended after week 6. Study participants were compensated for their time and allowed to keep the Garmin device.

After the intervention, the MDI Align app was revised to remove the survey component and push notifications. The app was released to the full MDI community, at no cost, on the Google Play and iOS app stores.

3.3 Results

The impact study produced several distinct data sources that both describe the experiences of the study population and provide insights into changes over the study period after the intervention materials. This section contains the results of the participant baseline and follow-up surveys, daily and weekly MDI Align surveys, participant engagement with the app, and the biometric data collected by the wearables. To provide an overview of the narrative structure of this section, we begin with the pre-intervention survey, which provides a fundamental and baseline description of the experiences of the participants. We assess key differences from the baseline to the post-intervention period. We then explore participant engagement with the app, the results of the in-app survey, and the biometric data. We turn to exploring pre-post differences in the MDI Align survey responses and changes in biometric indicators. Finally, we explore relationships between these measures across datasets where relevant.

3.3.1 Baseline and Follow-Up Survey

Survey Responses

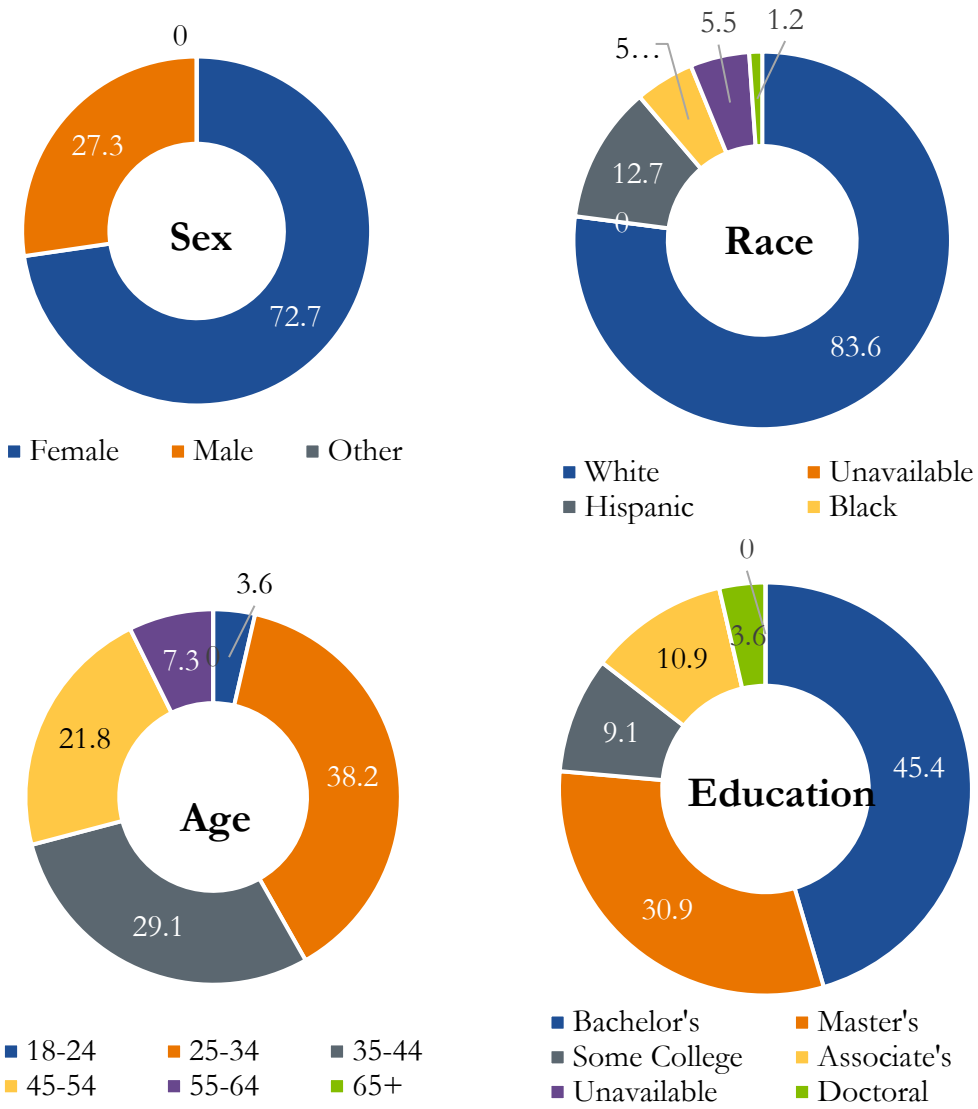
Fifty-five respondents completed the pre-intervention survey. All surveys were retained regardless of completion percentage to retain all data for sections that were completed. There were 53 completed post-intervention surveys, with one participant not completing the survey and one participant not completing the study as a whole. These datasets were merged together so that differences in scale values could be assessed.

Sample Population

Represented MDIs

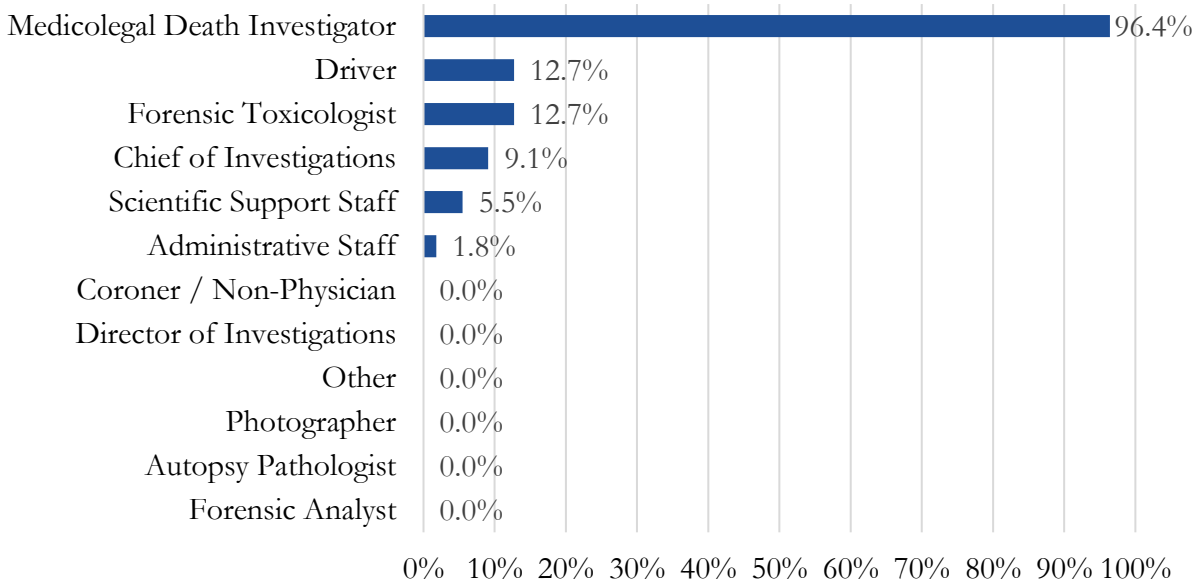
Figure 21 details the demographic breakdown of the study sample. Overall, a majority of the study identified as white (83.6%) and female (72.7%). Most respondents fell within the 25–34 age category. The sample was more educated than the national survey sample, with 79.9% possessing at least a bachelor's degree.

Figure 21. Participant Characteristics



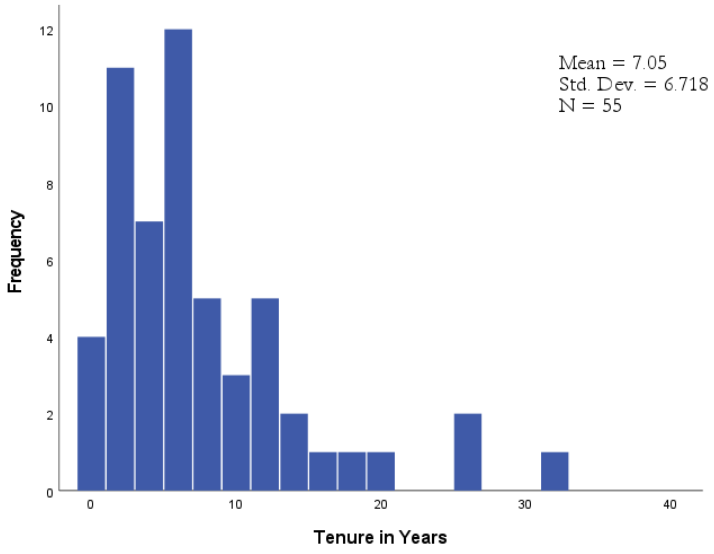
As expected, a majority of respondents identified their job role as MDI (96.4%). Chief of investigations (9.1%), forensic toxicologist (12.7%) and drivers (12.7%) are also represented in the survey, as secondary roles detailed in Figure 22 below. Eight respondents reported having secondary employment, seven of which are outside the field of MDI (e.g., emergency medical services, instructor, firefighter).

Figure 22. Job Role Distribution



Beyond variability in job role, a full range of job tenures was represented in the sample (**Figure 23**), ranging from less than a year to 31 years in the field. The average tenure of the sample was approximately 7 years. The median caseload for each respondent was about 14 cases per week, with one outlier reporting 160 cases per week.

Figure 23. Job Tenure Distribution



Represented Agencies

The respondents represented agencies from 26 states, with Colorado, Florida, and South Carolina being the most represented. A majority of respondents operated at the county level (68.5%), followed by state (16.7%) and regional offices (14.8%). The type of agency is reflected

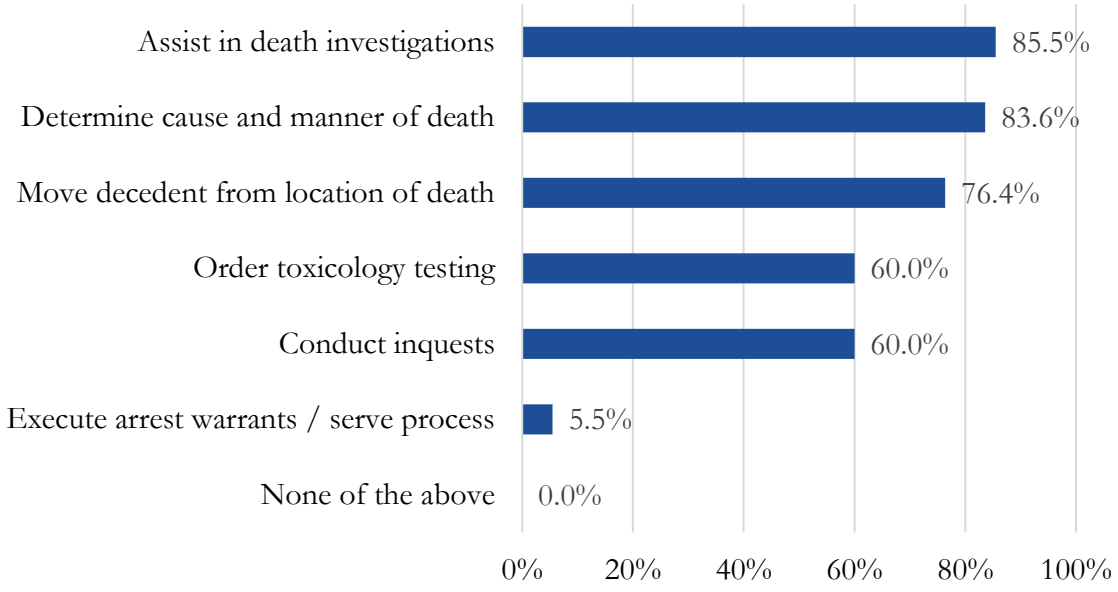
in **Table 9** below. These agencies most frequently reported to the county-level government (31.1%), public health agencies (26.1%), or no other agencies (i.e., were independent; 17.9%).

Table 9. Agency Type Distribution

Description of Office	*n*	%
County Government Office	26	47.3
Standalone Agency	14	25.5
Public Health Department	9	16.4
Forensic Science Division	3	5.6
District Attorney's Office	1	1.8
Law Enforcement Agency	1	1.8
[Missing]	1	1.8

These agencies performed a wide range of responsibilities, reflected in **Figure 24** below. The most common responsibilities were assisting medical examiners in death investigations (76.3%) and determining the cause and manner of death (75.3%). Only 2.2% of respondents reported working for agencies that executed arrest warrants and served process.

Figure 24. Agencies' Responsibilities



Key Descriptive Findings on MDI Stress, Health, and Wellness

Stress

The job-specific stress scale consists of 26 items related to the specific occupational conditions of working as an MDI. **Figure 25** presents a breakdown of how stressful respondents found

each of the stressors. The items related to dealing with the family of the deceased, including aggressive family members (82%), death notifications (69%) and multiple family members (61%), are consistently rated among the most stressful. Of the respondents, 63% rated working more than 24 hours in a row as stressful and this may contribute to the related issues of sleep quality and exhaustion described later. Suicide within the profession emerged as a major source of stress, with 83% of respondents being stressed by the suicide of a colleague. This further highlights the need for health and wellness resources among this population. The images and smells associated with the MDI profession were ranked as the least stressful.

The organizational stress scale consists of 21 items related to the organizational environment and conditions. **Figure 26** presents a breakdown of how stressful respondents found each of the stressors. By far, the largest organizational stressor was staff shortages, which likely compounds the effects of other stressors related to shift schedule and burnout and fatigue. Accountability items such as internal investigations and internal pressure were rated among the least stressful items.

Figure 25. Job-Specific Stress Likert Summary

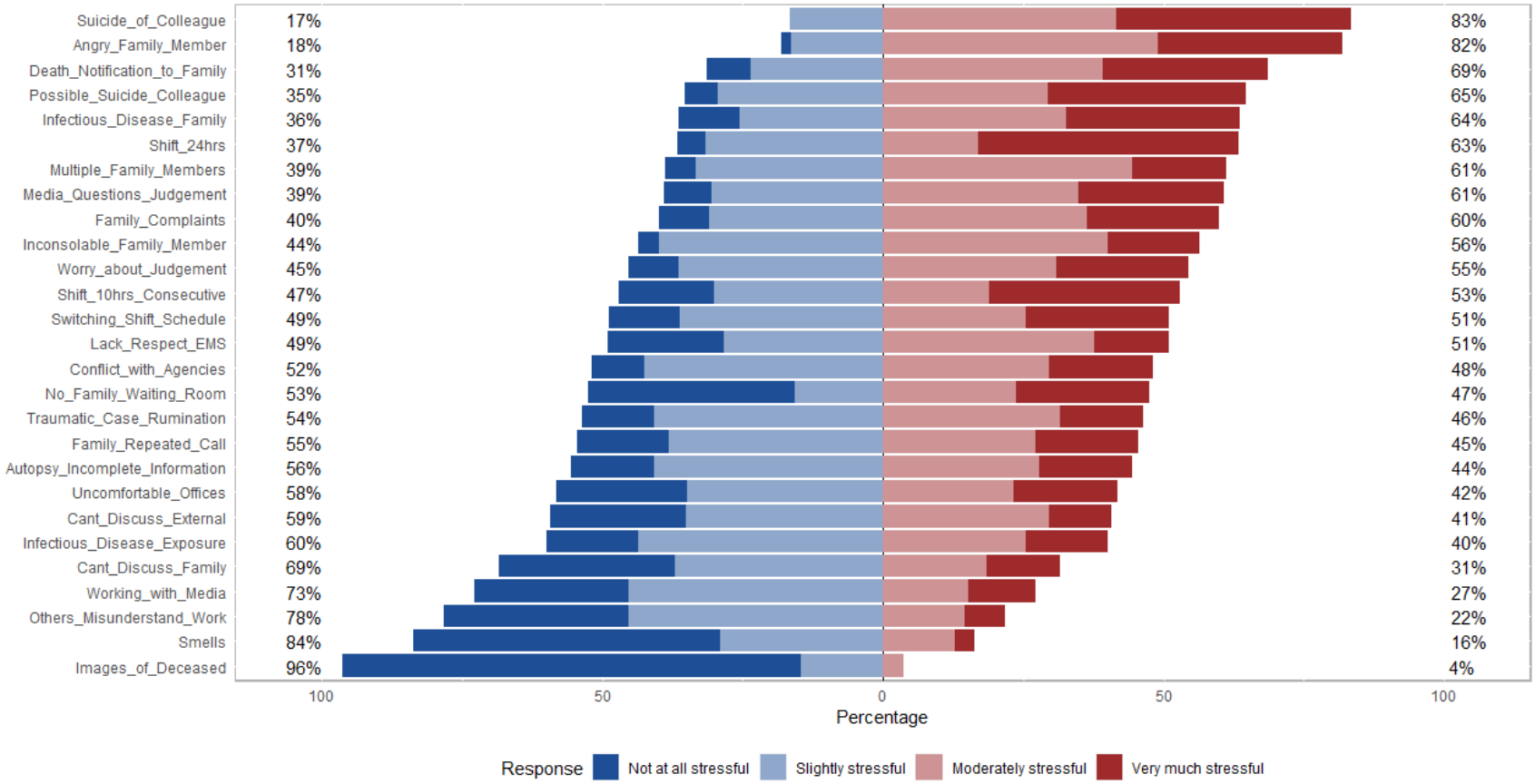
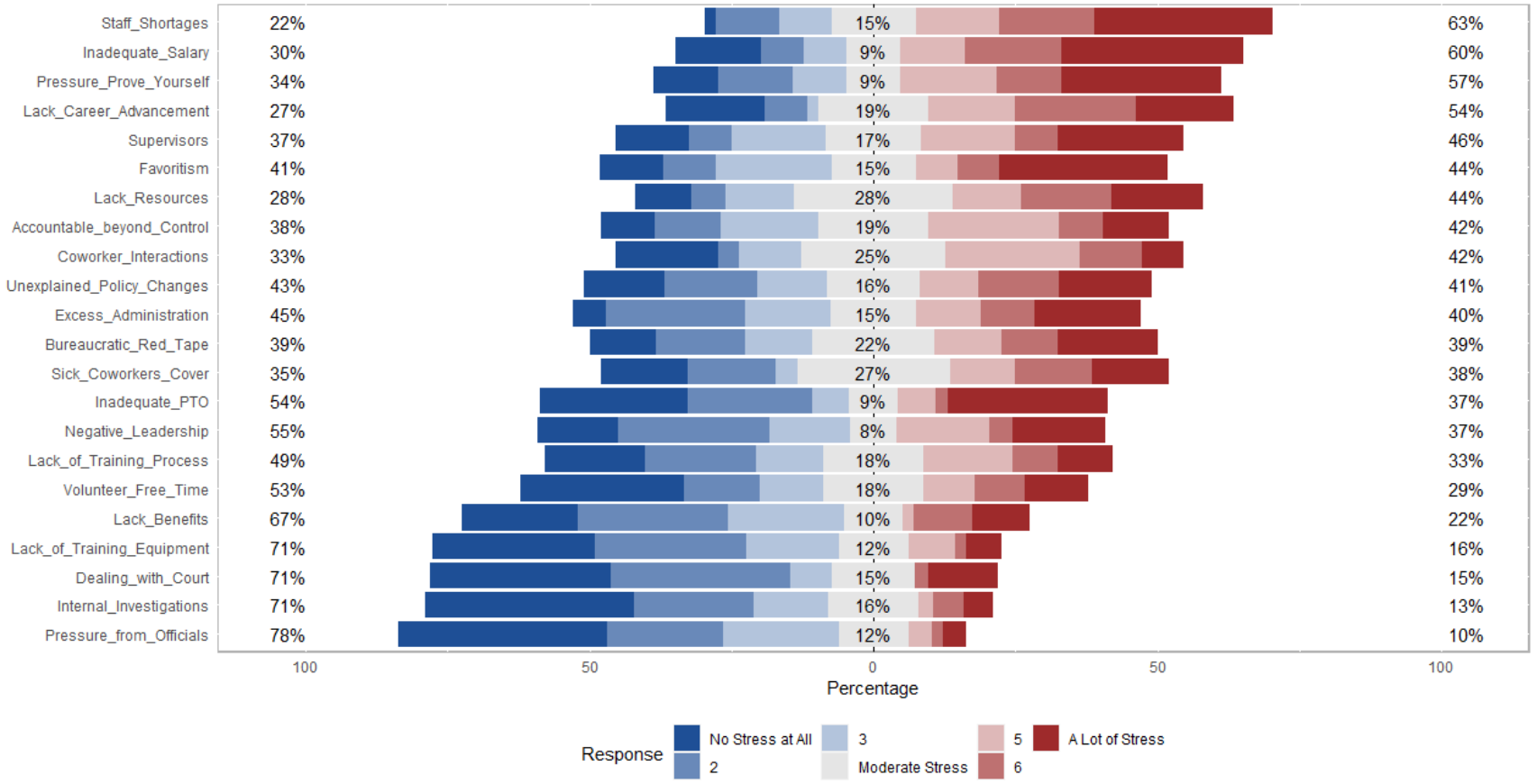
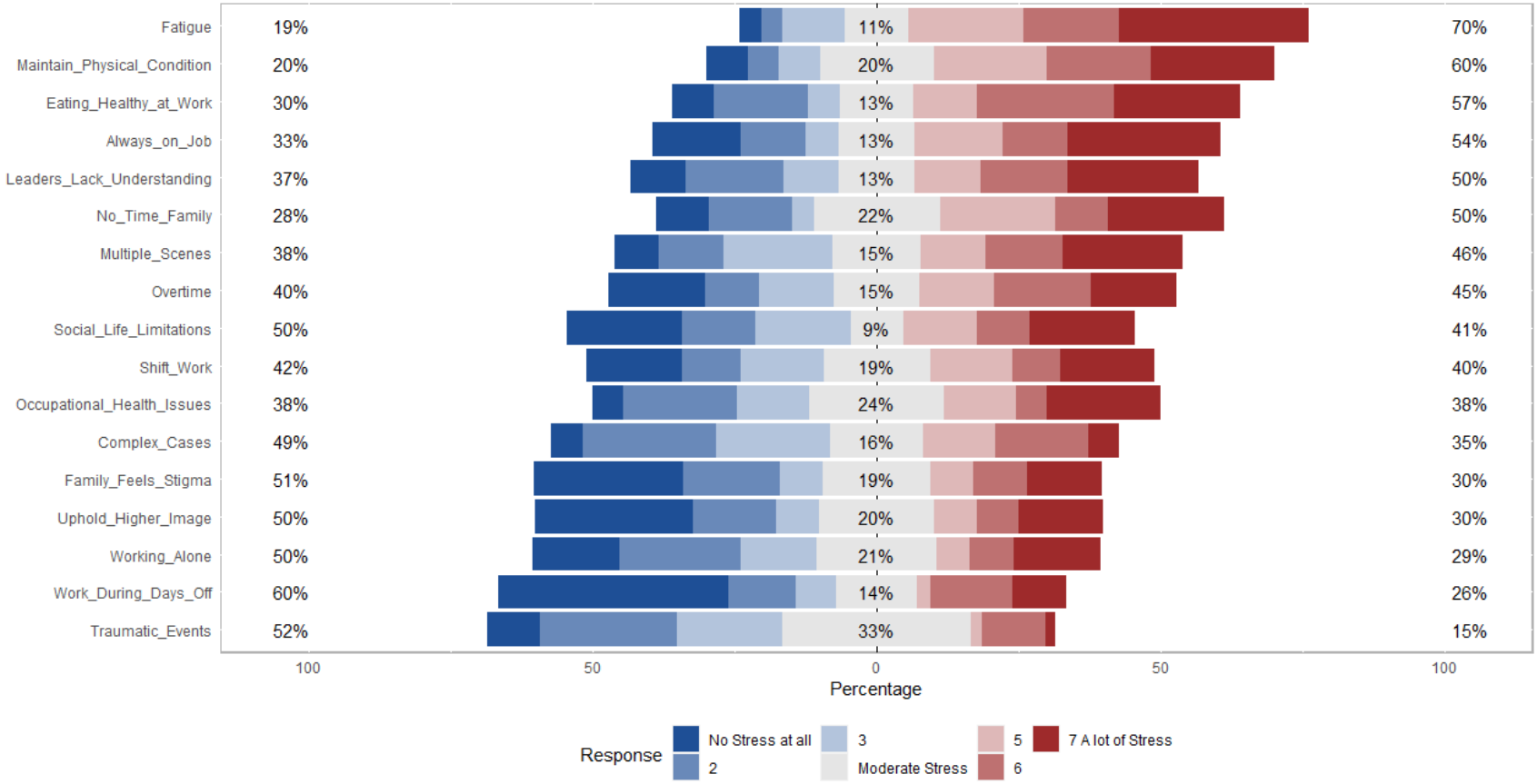


Figure 26. Organizational Stress Likert Summary



The operational stress scale consists of 17 items related to managing the profession. **Figure 27** presents a breakdown of how stressful respondents found each of the stressors. The top stressors appear to be related to managing health behaviors in the context of work: fatigue (70%), staying in shape (60%), and eating healthy (57%). Respondents also expressed frustration about the lack of understanding from political stakeholders or community leaders about the work. This however does not translate to high stress about stigma of their job or limitations to social life.

Figure 27. Operational Stress Likert Summary

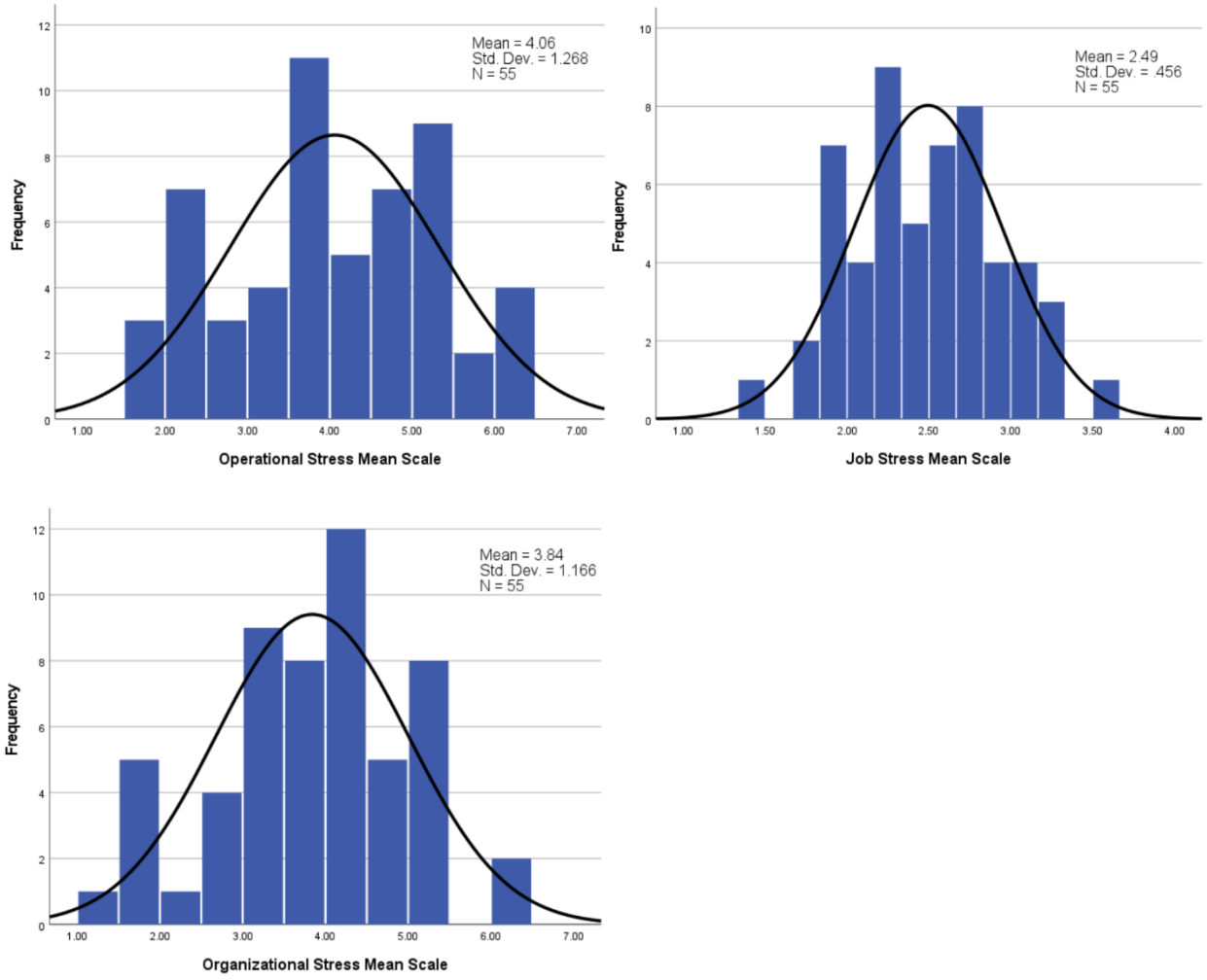


We also consider the levels of stress across individuals for each of the stress scales in **Figure 28**. The job-specific stress scale has high internal consistency with a Cronbach's α of 0.888 and is measured from 1 (low stress) to 4 (high stress). The distribution of job-specific stress among respondents was normally distributed, with a mean of 2.49 (SD = .456), indicating that 15% of respondents were between moderately and very stressed.

The organizational stress scale has high internal consistency with a Cronbach's α of 0.935 and is measured from 1 (low stress) to 7 (high stress). The distribution of job-specific stress among respondents is fairly normally distributed, with a mean of 3.84 (SD = 1.166), indicating that half of respondents are above the median value for stress.

The operational stress scale has high internal consistency with a Cronbach's α of 0.925 and is measured from 1 (low stress) to 7 (high stress). The distribution of job-specific stress among respondents is normally distributed, with a mean of 4.06 (SD = 1.268) and is similar to the organizational stress scale distribution.

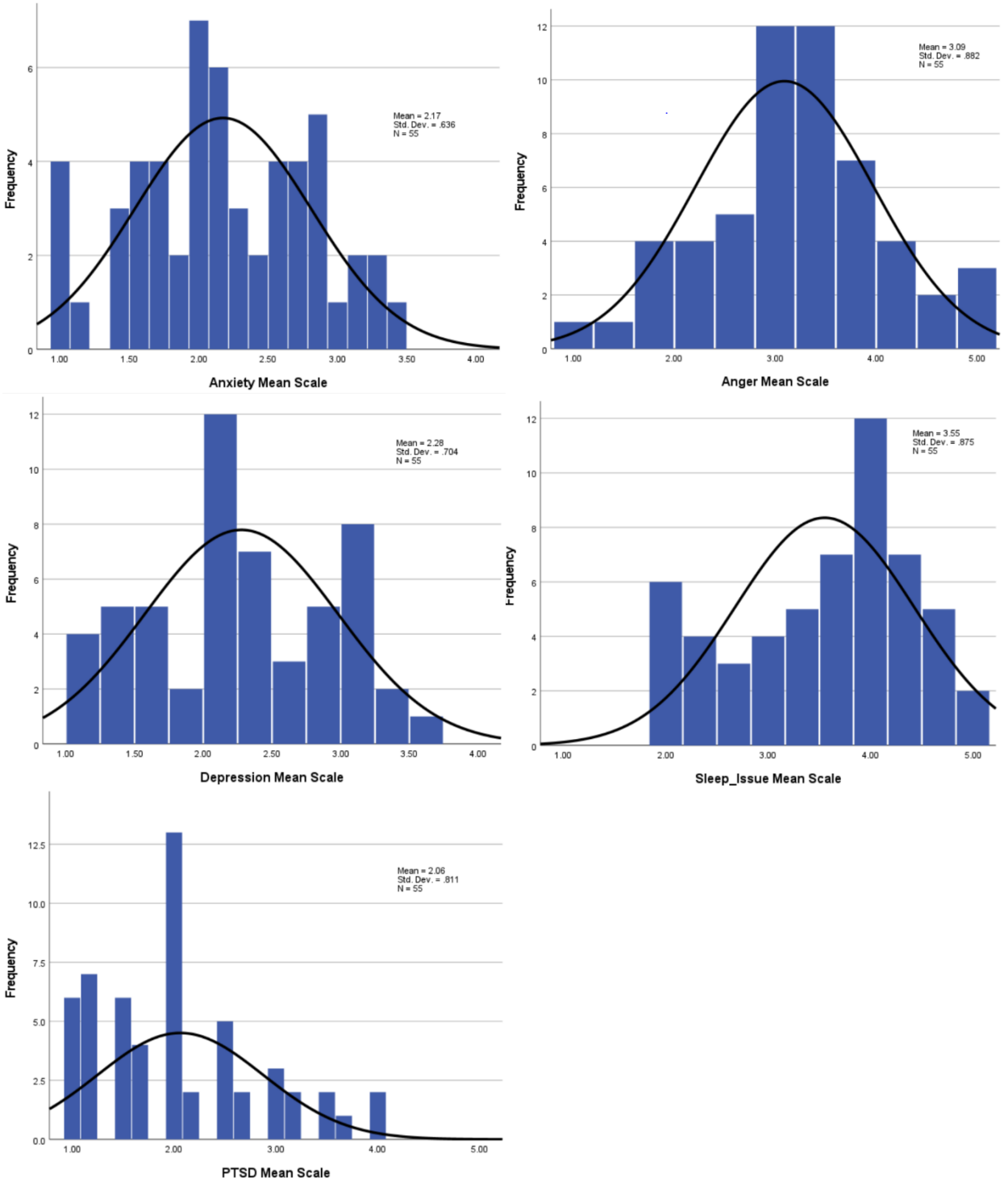
Figure 28. Stress Scale Distributions



Health and Wellness

The survey measured a number of health outcomes related to the stress and operational conditions of working as an MDI. **Figure 29** below is a matrix of histogram distributions of the health scales including sleep quality, depression, anxiety, anger, and PTSD.

Figure 29. Health Outcome Distributions



The **sleep quality** scale (Cronbach's α: 0.763) is an index of three questions examining difficulty falling asleep, staying asleep, and an overall rating of sleep quality ranging from 1 (no difficulty with sleep) to 5 (high difficulty with sleep). The sample had a mean score of 3.55 (SD = .875), indicating that over half of the population had difficulty with sleep. A quarter (25%) of the sample reported poor or very poor sleep quality, while only 10% had good sleep.

The **depression** scale (Cronbach's α: 0.779) is an index measure of five questions examining depression, sleep difficulty, loneliness, and trouble with motivation, ranging from 1 (low depression) to 4 (high depression). The sample had a mean score of 2.28 (SD = .704), with most of the sample scoring low on the depression scale. 22% of respondents reported moderate of high levels of depression. This is largely driven by the question on sleep quality, a known issue for this population.

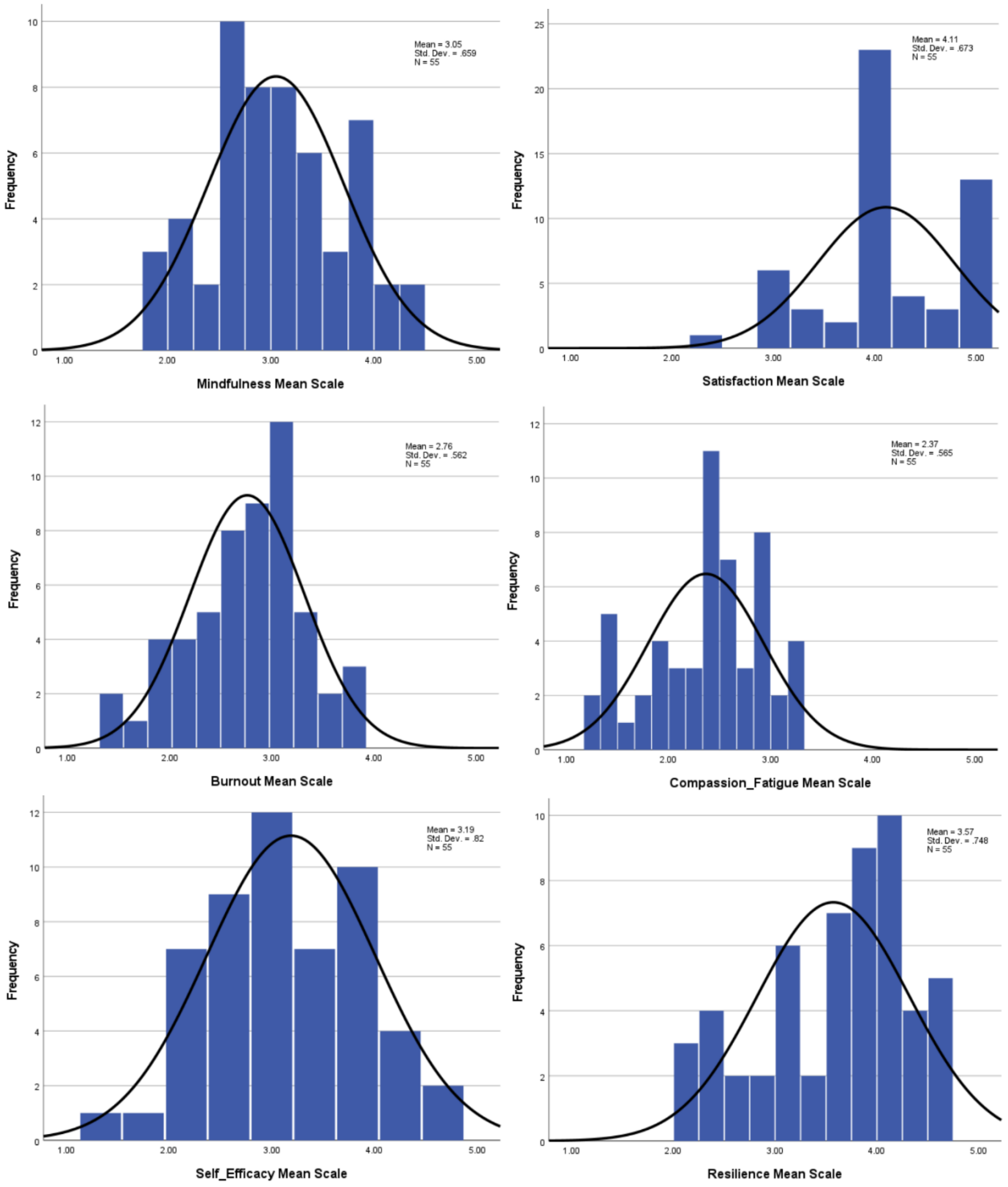
The **anxiety** scale (Cronbach's α: 0.814) is an index measure of seven questions examining nervousness, difficulty relaxing, restlessness, and irritability, ranging from 1 (low anxiety) to 4 (high anxiety). The sample had a mean score of 2.17 (SD = .636), with the sample heavily skewed toward low anxiety. Of respondents, 11% reported moderate of high levels of anxiety.

The **anger** scale (Cronbach's α: 0.919) is an index measure of five questions examining anger, irritability, and annoyance ranging from 1 (low anger) to 5 (high anger). The sample had a mean score of 3.09 (SD = .82), with the sample being normally distributed and 50% of respondents reporting above-median values of anger.

The **PTSD** scale (Cronbach's α: 0.806) is an index measure of four questions examining reliving past trauma, avoidance of stimuli, and isolation, ranging from 1 (low PTSD) to 5 (high PTSD). The sample had a mean score of 2.06 (SD = .811), with the sample heavily skewed toward low PTSD. Few (3.6%) of respondents reported moderate or high levels of PTSD.

Additionally, the survey included measures of MDI job-related attitudes. **Figure 30** below is a matrix of histogram distributions of the outlook scales including burnout, compassion fatigue, perception of coping self-efficacy, and mindfulness.

Figure 30. Wellness Outcome Distributions



The **burnout** scale (Cronbach's α: 0.871) is an index of 21 questions examining work fatigue, strain, frustration, and perceptions of accomplishment ranging from 1 (low burnout) to 5 (high burnout). The sample had a mean score of 2.76 (SD = .561), and normally distributed with a majority of respondents experiencing a moderate level of burnout. Higher levels of burnout were driven largely by feeling fatigue at the end of the day and apprehension about the following day of work.

The **compassion fatigue** scale (Cronbach's α: 0.909) is an index of 25 questions examining job enjoyment, fatigue, self-actualization, and satisfaction helping others, ranging from 1 (low compassion fatigue) to 5 (high compassion fatigue). The sample had a mean score of 2.37 (SD = .565) and is slightly skewed toward the population not having high compassion fatigue. About one in 10 (11%) of respondents exceeded the median scale value of 3, indicating very little extreme compassion fatigue. While most respondents reported satisfaction being able to help others, compassion fatigue was largely driven by overwhelming caseload.

The **coping self-efficacy** scale (Cronbach's α: 0.916) is an index of 12 questions measuring problem-solving, rumination, and help-seeking behavior ranging from 1 (low self-efficacy) to 5 (high self-efficacy). The sample had a mean score of 3.19 (SD = .82), indicating that most respondents reported average levels of coping self-efficacy. At the item level, respondents reported a strong ability to break down problems but the reliance on others (friends and coworkers) is lower. Only 5.5% of respondents reported a critically low level of coping self-efficacy (2 or lower).

The **mindfulness** scale (Cronbach's α: 0.863) is an index of 13 questions measuring mindfulness and awareness of one's thoughts and actions, ranging from 1 (low mindfulness) to 5 (high mindfulness). The sample had a mean score of 3.05 (SD = .659), indicating an average level of mindfulness among respondents. This differed from the larger survey of MDIs by having much lower levels of reported mindfulness.

The **resilience** scale (Cronbach's α: 0.89) is an index of six questions measuring how quickly and effectively respondents bounce back from difficulties, ranging from 1 (low resilience) to 5 (high resilience). The sample had a mean score of 3.57 (SD = .748), indicating a high level of resilience among respondents.

The **job satisfaction** scale (Cronbach's α: 0.837) is an index of five questions measuring how much they enjoy their current profession and position, ranging from 1 (low satisfaction) to 5 (high satisfaction). The sample had a mean score of 4.12 (SD = .673), indicating a very high level of job satisfactions among respondents despite reported stressors.

3.3.2 Resource and Wellness Landscape

General Health

The following shows the distribution of self-reported general health. No respondents categorized their general health as poor.

Table 10. General Health

Rating	Pre-implementation (%)	Post-implementation (%)
Fair	34.5	28.3
Good	40.0	43.4
Very Good	21.8	24.5
Excellent	3.6	3.8

Caffeine. The modal response was one caffeine serving per day (34.5%), with 27.3% having 2–3 per day.

Tobacco. Only four respondents reported smoking any cigarettes. One of these respondents smoked more than 21 per day. Only three respondents reported using any other tobacco products.

Alcohol. Of respondents, 29.1% reported consuming no alcohol. An additional 25.5% reported 1–3 drinks per month. Nine respondents (16.4%) reported having at least one alcoholic drink per day.

Post-intervention Differences

This section uses the post-intervention survey to explore differences in the paired pre-post values for each scale.

Table 11. Post-Intervention Changes in Self-Reported Health and Wellness Metrics

Scale	Pre-mean	Post-mean	Significance	Narrative
Job Stress	2.49	2.41	t = 1.72, p = .090	Lower stress but not significant
Sleep	3.52	3.17	t = 3.82, p < .001	Significant reduction in sleep issues
Burnout	2.76	2.79	t = -.76; p = .453	No significant differences
Compassion	2.36	2.33	t = .82; p = .415	No significant differences
Anger	3.06	3.06	t = -.04; p = .965	No significant differences
Depression	2.25	2.07	t = 2.75, p = .008	Significant reduction in depression
Anxiety	2.17	2.04	t = 1.67, p = .101	Lower anxiety but not significant
Resilience	3.58	3.64	t = -.78; p = .438	No significant differences
PTSD	2.04	2.86	t = −9.75, p < .001	Significant increase in PTSD

Scale	Pre-mean	Post-mean	Significance	Narrative
Satisfaction	4.15	4.26	t = -1.71; *p* = .094	Increased satisfaction but not significant
Self-Efficacy	3.21	3.47	t = −3.74; *p* < .001	Significant increase in coping self-efficacy
Mindfulness	3.05	3.09	t = -.75; *p* = .457	No significant differences

All mean changes were in the predicted direction, with significant improvements to sleep quality, depression and coping self-efficacy. The only exception was PTSD, which is explored further below.

Post-intervention Survey

The post-intervention survey contained an additional set of questions meant to reflect on the user experience and perceptions of the app, and their usage. As described in **Tables 11 and 12**, the perceived helpfulness of the app and its ability to improve wellness behaviors greatly varied. Participants indicated that the app was most helpful in forcing them to find time for a break and reflect on their day, but that it was also hard to find that time in the first place, which added to their day the additional stress of complying with the study protocol.

Table 11. App Helpfulness Ratings

Rating	No.	%	Comments
Not at all helpful	8	15.1	Videos added new stress; not interactive enough
Slightly helpful	13	24.5	Hard finding time for app; functionality low
Somewhat helpful	13	24.5	Helped with decompressing; good resources
Very helpful	17	32.1	Forced me to take break; geared toward MDIs
Extremely helpful	2	3.8	Helped me realize stress I was denying

Table 12. App Wellness Improvement Ratings

Rating	No.	%	Comments
Not at all	10	18.9	Limited access schedule; don't care for extra task
Slightly	12	22.6	Didn't help me sleep; need longer-running audio files
Somewhat	17	32.1	Tips were useful; did not *need* the app's help
Very much	13	24.5	Meditation portions helped me take time; exercise
Extremely	1	1.9	Gave me focus

App Engagement and User Data

This section of analysis uses the Mixpanel data to examine metrics related to app engagement and usage over the course of the study. These data are an important way to describe the

dosage of the intervention, which informs expectations about the potential impact of the intervention. One important caveat comes from the post-intervention survey. Around half of respondents (*n* = 25) reported accessing the wellness content directly from YouTube, outside the app. This means that the numbers reported in this section are a likely undercount of engagement. It is not feasible to gauge usage beyond what we have available from direct app engagement, so these data are still valuable.

Mixpanel Data Description

The universe of raw data (*n* = 13,263) for these analyses was initially filtered by participant ID (MDIALIGN11 − MDIALIGN65) and date to eliminate testing scenarios and engagement outside the study period (10/18/2022–12/05/2022). Although a majority of participants were finished by end of November, a few participants started late and finished in December. We utilized a cutoff of December 5, 2022, based on the completion of the post-intervention surveys. The final dataset includes 12,477 events.

These events tracked by Mixpanel include the sessions themselves, engagement with the surveys, and clicking on audio, video, and tip links. It is important to note that the audio and video material did not become available for 2 weeks past the start date of the study (pre-intervention period), so the total count of these events is for a shorter time period. Select metrics for overall app usage and participant-specific usage are detailed below.

Global Usage Metrics

Table 13 below describes the frequency distribution of in-app events as recorded by Mixpanel. During the study period there were a total of 4,060 app sessions initiated. On average, these sessions lasted an average of 1 minute and 8 seconds, though visits ranged from 10 seconds to nearly 50 minutes. During the intervention period of the study, participants linked to 382 video files, 595 audio files, and 321 health and wellness tips.

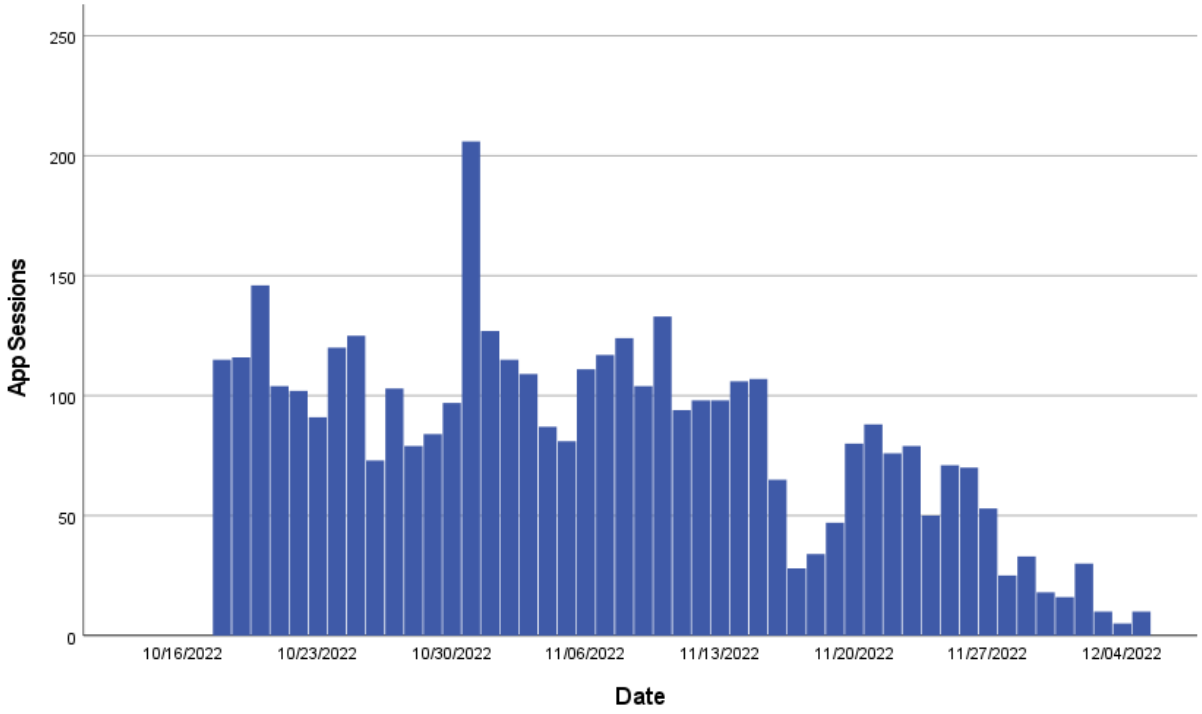
Table 13. App Event Frequency

Event	No.
App Session	4,060
Survey Start	3,763
Video Link	382
Audio Link	595
Tip Click	321

Engagement with the app was relatively constant over the study period, with a decrease toward the end as participants concluded their involvement (See **Figure 31**). The spike in usage near the end of October corresponded to the introduction of the intervention and app content, while the drop-off in mid-November corresponds to a technical issue with surveys in the app. Following the introduction of app content on October 30, 2022, there were a total of 2,705 app

sessions. Overall, 14.2% of sessions resulted in a video link, 22.0% in an audio link, and 11.9% in a wellness tip click. The most popular video content was related to Katharine Pope (former MDI and wellness coach) (37.7%), and the most popular audio content was the meditation bell sounds (37.6%). An additional 37.6% of audio links were related to meditations and body scans, the most popular of which was the 5-minute body scan (*n* = 64). The most clicked tips were related to drinking water (12.1%) and self-care commitment (5.3%).

Figure 31. User Engagement over the Study Period



Participant-Level Metrics

It is also important to consider interaction with the app at the individual participant level. On average, each participant engaged in 74 app sessions. **Table 14** below summarizes the participant-level range for selected app events. Looking at the ratio of mean to SD, it becomes clear that there was a wide degree of variability in-app engagement across participants. A few participants engaged with no in-app material (*n* = 4), and one outlier had the max values for every category. This single participant accounted for 7% of video links, 15.5% of audio links, and 26% of all tip clicks.

Table 14. Participant-Level App Behaviors

Event	Mean (SD)	Min	Max	No. Links
App Session	73.8 (36.1)	10	178	Not applicable (N/A)
Video Link	6.9 (6.5)	0	27	7

Event	Mean (SD)	Min	Max	No. Links
Audio Link	10.8 (15.1)	0	92	8
Tip Click	5.8 (12.4)	0	84	16

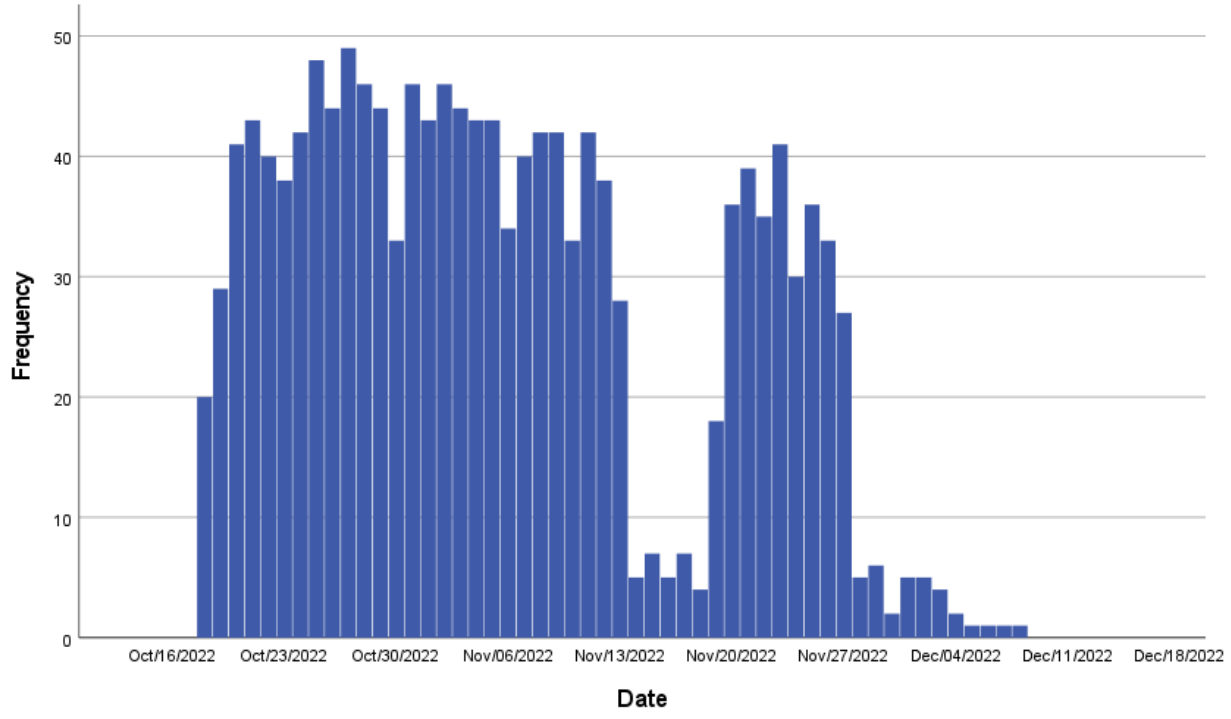
MDI Align In-App Surveys

This section of analysis uses the daily and weekly surveys collected in the MDI Align app to characterize the stress management behaviors of the participants and identify sources of stress. These data are an important source of granular stress information that can later be connected to other metrics of stress across data sources. Each participant was tasked with completing a daily survey in the app related to stress and sleep quality, as well as a weekly survey about aspects of the past week as a whole. Although the attrition rate was low, the study losing only one participant over its course, there were gaps in daily surveys across the range of participants.

MDI Align Data Description

The data were collected in such a way that submission of a daily survey and weekly survey on the same day contributed to the same survey record. Between October 18 and December 8, 2022, there were a total of 1,437 survey records. Participants ranged from between 10 and 42 days of survey data collection, with an average of 26.6 across the 54 participants. Most participants were engaged October 18–November 27, with the dip in survey completion attributed to an app access issue in mid-November (see **Figure 32**).

Figure 32. MDI Align Survey Participation by Study Week



Weekly Survey Data

The weekly survey asked about stress reduction strategies employed both at work and at home. **Tables 15** and **16** below summarize the number of times each option was selected and how many individuals used that strategy at least once. For work resources, informal lunches or hangouts with coworkers were most common (64.8%), followed by unspecified other (59.3%), and meditation (53.7%). For strategies outside of work, zoning out, hobbies, and exercise were most common. Over the course of the study every participant reported engaging in at least one work-based stress management resource each week, with a max of five in a week (M = 1.5). For at home strategies, the mean was 3.4 strategies per week. At the beginning of the study period, participants were asked about current (baseline) wellness and meditation behaviors. Less than half (41.4%) reported never having tried meditation, while most other participants had at least tried it, with three participants reporting daily usage. The focus of participant wellness was fairly evenly divided between general health, mental health, sleep quality, and work anxiety.

Table 15: Work Resources

Resource/Strategy	Frequency (Times per Week)	No. Participants (%)
Coworker Lunches	96	35 (64.8%)
Meditation/Yoga	59	29 (53.7%)
Outside Gatherings with Colleagues	27	19 (35.2%)
Exercise	21	13 (24.1%)
Sharing Accomplishments	16	12 (22.2%)
Informal Mentoring	15	9 (16.7%)
Health Trainings	14	9 (16.7%)
Stress Trainings	14	11 (20.4%)
Critical Incident Stress Debriefing	5	3 (5.5%)
Therapy/Counseling	3	3 (5.5%)
Peer Support Program	3	3 (5.5%)
Other	77	32 (59.3%)

Table 16: Home Resources

Resource/Strategy	Frequency	No. Participants (%)
Exercise	114	37 (68.5%)
Zoning Out (TV, internet, napping)	111	41 (75.9%)
Hobbies	85	39 (72.2%)
Family Support	72	30 (55.6%)
Friend Support	72	30 (55.6%)
Meditation/Yoga	65	28 (51.9%)

Alcohol	56	22 (40.7%)
Avoiding Violent Media	51	25 (46.3%)
Socializing with Coworkers	43	23 (42.6%)
Media Detox	25	13 (24.1%)
Therapy/Counseling	22	9 (16.7%)
Religion/Community	19	8 (14.8%)
Travel	15	13 (24.1%)
Learning Skills	11	7 (13.0%)

Of the 228 weekly survey responses, 44.3% (*n* = 101) were reported as being different than a normal week. This was attributed to family demands (*n* = 21; 20.8%), vacation (*n* = 19; 18.8%), sickness (n = 14; 13.9%), working more than usual (*n* = 31; 30.7%), and unspecified other (*n* = 48; 47.5%). These circumstances were divided across 43 of the respondents.

In addition, 41 respondents also reported 94 challenging cases. The nature of these cases is in **Table 17** below.

Table 17. Frequency of Challenging Cases by Type

Challenging Case Type	Frequency
Complex	28 (29.8%)
Infant/Child	24 (25.5.%)
Homicide	8 (8.5%)
Multiple Fatalities	6 (6.4%)
Drug Overdose	5 (5.3%)
Individual You Know	4 (4.3%)
Someone Reminds You of Someone You Know	4 (4.3%)
Someone Similar to You	2 (2.1%)
Other	33 (35.1%)

Daily Stress and Sleep Survey

Participants were asked to report issues and events at work each day. Of the 661 days reported as having a work shift, participants identified at least one issue every day. The prevalence of work issues and stressors are presented in **Table 18** below, highlighting the total count of issues, the percentage of workdays with that problem, and the number of participants who have experienced that issue. The most frequently reported issues were fatigue, which was experienced by all but one participant, and reported on 56% of recorded surveys. This is followed by working alone (32.5%) and excessive administrative duties (32.4%). These stressors are experienced widely throughout the community, ranging from court duty on the low end (9.3%) to fatigue (98.1%).

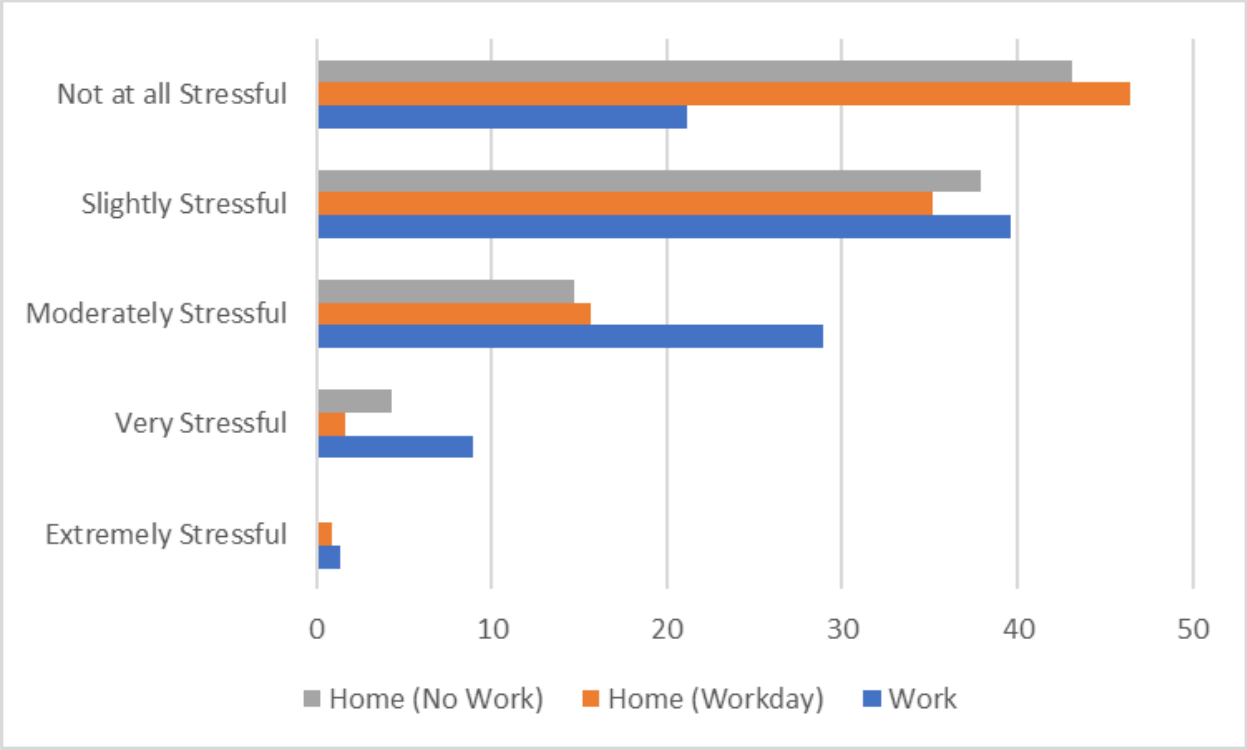
Table 18. Prevalence of Work Issues and Stressors Experienced by Participants

Issue or Event	Frequency (% Workdays)	No. Participants (%)
Fatigue	371 (56.1%)	53 (98.1%)
Working Alone	215 (32.5%)	42 (77.8%)
Excessive Administrative Duties	214 (32.4%)	37 (68.5%)
Inadequate Staffing	184 (27.8%)	40 (74.1%)
Multiple Scenes/Cases	178 (26.9%)	44 (81.5%)
Insufficient Breaks	157 (23.8%)	38 (70.4%)
Not enough time for family	143 (21.6%)	31 (57.4%)
Occupational Health Issues	98 (14.8%)	28 (51.9%)
Difficulty with Decedent's Family	92 (13.9%)	36 (66.7%)
Difficulty with Coworkers	86 (13.0%)	27 (50.0%)
Death Notification	75 (11.3%)	22 (40.7%)
Difficulty with Supervisors	60 (9.1%)	23 (42.6%)
Lack of Resources	60 (9.1%)	24 (44.4%)
Conflict across Agencies	44 (6.7%)	19 (35.2%)
Lack of Respect	34 (5.1%)	12 (22.2%)
Court Duty	8 (1.2%)	5 (9.3%)

Stress

Participants were asked to self-report their stress levels both at work and outside of work. **Table 19** below summarizes the stress levels for three conditions: stress at work, stress at home on a workday, and stress at home on a day without work. Work was reported as more stressful than stress outside the workplace, and there were no consistent differences in stress outside of work between workdays and days off.

Table 19. Daily Stress Levels



Sleep

A total of 1,247 nights of sleep data were collected. Around one-quarter of nights were self-rated as bad sleep nights: very bad was chosen 56 times (4.5%), and fairly bad 272 times (21.8%). Most (73.7%) of nights were rated as good sleep quality: very good was chosen 274 times (22.0%) and fairly good was chosen 645 times (51.7%). It is clear that these ratings of sleep quality are related to the number of hours of sleep; see **Table 20**.

Table 20. Number of Hours of Sleep per Day

Sleep Duration (hours)	No. (%)
Less than 4	74 (5.9%)
4–6	319 (25.6%)
6–8	591 (47.4%)
More than 8	263 (21.1%)

Bivariate Relationships

Serving as both additional description and validation of the stress, stressors, and sleep metrics recorded by the daily surveys, we also present the matrix of bivariate correlations for the key measures. These correlations are analyzed at the daily survey rather than the participant level. Because the measurement of self-reported stress and sleep was recorded on a Likert scale,

producing ordinal data, we employ Spearman's rank order correlation. This approach assesses the correlation in ordinal variables having high ranks coincide with each other. The measurement of included variables is summarized below (see also **Table 21)**.

Stress

- Work Stress: 1–5 ordinal Likert of self-reported stress level at work
- Home Stress: 1–5 ordinal Likert of self-reported stress level outside work
- Work Resources: 0–5 count of how many work stress management resources used
- Home Resources: 0–10 count of how many home stress management resources used
- Work Issues: unlimited count of how many issues they faced at work (fatigue, conflict, caseload)
- Case Challenges: unlimited count of how cases were particularly challenging (homicide, child, etc.)

Sleep

- Sleep Quality: 1–4 ordinal Likert of self-reported sleep quality
- Sleep Quality: 1–4 ordinal Likert of self-reported sleep duration ranges

Table 21. Correlations between Study Variables

Construct	1	2	3	4	5	6	7
Work Stress	*						
Home Stress	.383**	*					
Work Resources	-.100**	-.028	*				
Home Resources	-.099**	-.028	.994**	*			
Work Issues	.928**	.373**	-.102**	-.101**	*		
Case Challenges	.349**	.145**	-.010	-.008	.329**	*	
Sleep Quality	-.100**	-.113**	.024	.021	-.104**	-.025	*
Sleep Duration	-.162**	-.060*	.054	.056*	-.176**	-.031	.522**

Note: ** Correlation is significant at the 0.01 (hundredths) level; * Correlation is significant at the 0.05 level

All relationships are in the anticipated direction, though a few are worth highlighting. No causality is implied. Work stress was almost perfectly correlated with the number of work issues the participant encounters in a given day, as well as the presence of particularly challenging cases. *Engaging in stress management behaviors at work and at home were related to and protective against work stress at work and at home.* And as expected, both work and home stress contributed to poorer quality sleep and less of it.

MDI WRAP Biometric Data

This section of analysis uses the biometric data collected by Garmin and the WRAP platform to characterize the quality of sleep and stress levels experienced by participants over the course of the study. These data serve as important outcome measures for the study due to direct and consistent measurement beyond the self-reporting in the MDI Align surveys. The initial data descriptions provide a baseline understanding of stress and sleep in the population, though the real value of these measures come from (1) the ability to correlate stress and sleep outcomes with stress events from the daily surveys, (2) the ability to provide a pooled examination of pre-post differences in stress following the intervention, and (3) access to MDI stress materials though the app.

WRAP Data Description

These biometric data were collected directly from the Garmin Vivoactive 4. While disaggregated measures exist for each topic area, we focused on the global measures of sleep, stress, and exercise. For the purposes of these analyses, each metric is aggregated to the daily level, allowing for alignment with the MDI Align daily survey dataset.

- **Sleep:** Measured as the total time in hours that the Garmin indicated the participant was asleep for a given date.
- **Stress:** Garmin produced a daily summary metric based on HRV, to indicate the level of stress for a given date. This metric was represented by a value between 0 and 100, with quartile ranges being used to describe resting state, low stress, medium stress, and high stress (Garmin Ltd., n.d.).
- **Exercise:** Number of steps on a given date.

These data are highly responsive to data collection or quality interruptions at the participant level. If the device was not worn for a sufficient amount of time, the hours of sleep, and average stress levels could not be estimated. Across the 54 participants, there were 1,937 sleep observations. This is roughly 78% of the 2,482 total study days for which sleep could be recorded. There were 2,482 daily summaries across these participants, containing stress, heart rate, and exercise data. Of these, there were only 104 days (4.2%) with insufficient data to estimate these global measures.

Population-Level Descriptives

Sleep

A majority of recorded sleep sessions fell within the expected values, although there was a large range, spanning from only a few minutes in a day to almost 20 hours of sleep in a 24-hour period. When we look at participant-level averages (each sleep aggregated to the participant), with outliers they range from about 4 to 11 hours of sleep, with most participants ranging from 6 to 10 (see **Table 22**).

Table 22. Biometric Sleep Quantity Summary

Sleep Metrics	Value in Hours
Mean	7.77
SD	2.15
Minimum Value	0.12
Maximum Value	19.87

Exercise

Exercise was not a primary outcome of interest but is important to understand due to the calculation of stress as a function of HRV. The daily step count may serve as a proxy measure for exercise and be an important consideration for the measurement of stress. The most important exercise metric for the purpose of this study is its relationship with the measurement of stress. Using a Pearson's correlation, there is no evidence of a correlation between number of steps and time spent in stress (r = -0.007; *p* = .728) or the average stress level (r = 0.018; *p* = .378; see **Table 23**). This suggests that Garmin stress metrics actually reflected experiences of stress rather than time spent in physical activity. This aligned with Garmin's claim that "to ensure changes in HRV are due to stress and not exercise, Garmin ignores this variability data when you are active and exercising."

Table 23. Daily Number of Steps per Day

Step Metrics	Value in Steps
Mean	5,719
SD	3,650
Minimum Value	0
Maximum Value	63,774

Stress

Based on the exclusion of exercise-related stress and the existing validity of Garmin's proprietary metric, the average stress score for the day and the daily duration of stress were selected as the outcome variables of stress (**Table 24** and **Figure 33**). They were highly correlated at *(*r= 0.61), but there was enough variability to suggest that both measures are of importance. It may be the population of this study was more prone to high stress; the average time per day spent at a stress score above resting (25–100) was over 8 hours per day, ranging from a few minutes to almost the entire day. Taken together, this means that the average participant spent more time stressed than asleep. To better contextualize the total time spent stressed, we also looked at the subset of time spent in the high-stress range. As a subset, the time spent in high stress was far lower than the total stress value. It was also heavily skewed

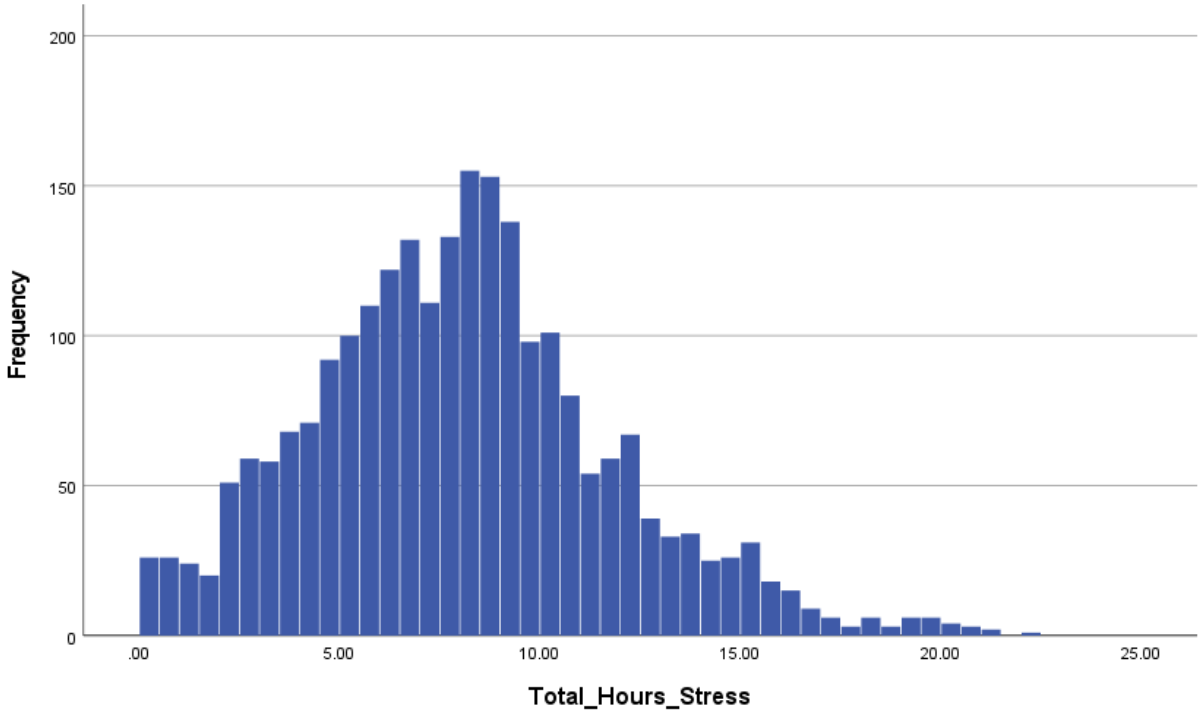
toward less than an hour of high stress per day, though for some, high stress lasted for most of the waking hours.

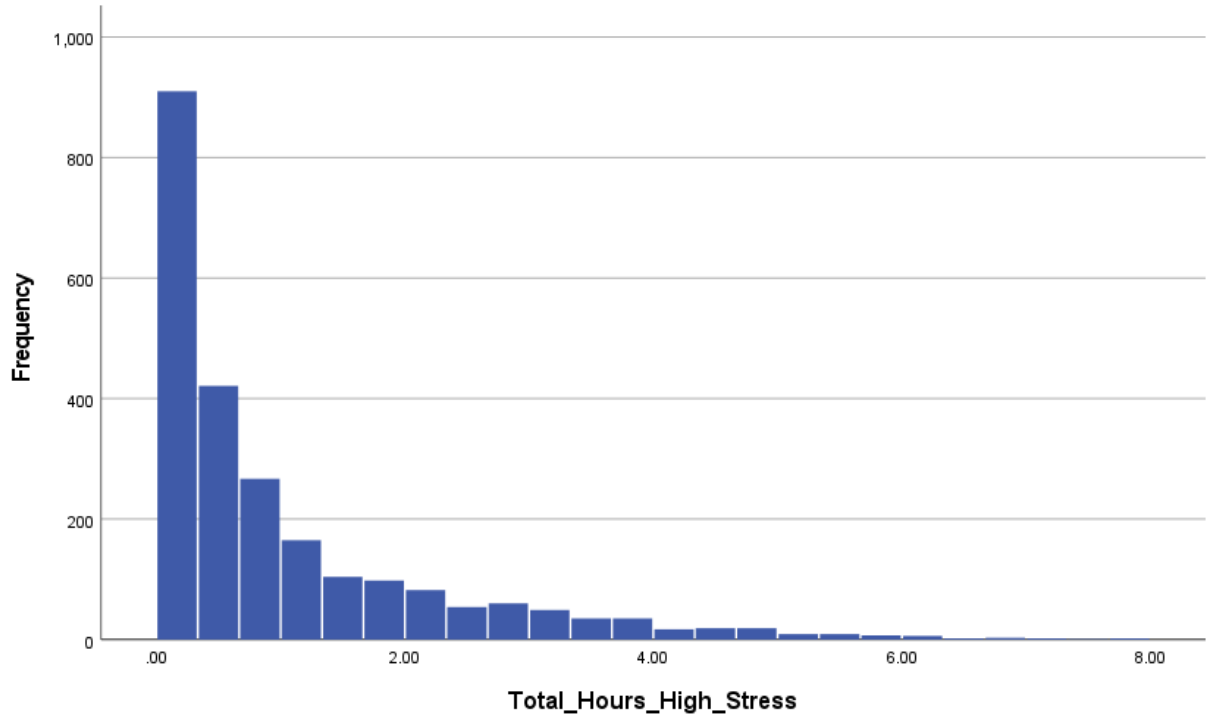
The averages of daily stress duration aggregated to each participant ranged from 2.2 hours to 15.4 hours. Participant-level aggregates for high stress ranged from 0.1 to 3.7 hours of high stress per day.

Table 24. Daily Amount of Time Spent in Total and High Stress

Descriptive Statistic	Daily Stress Duration in Hours	Daily High Stress Duration in Hours
Mean	8.03	1.03
SD	3.75	1.29
Minimum Value	0.02	0.00
Maximum Value	22.18	11.15

Figure 33. Distribution of Number of Hours Spent in Total and High Stress per Day



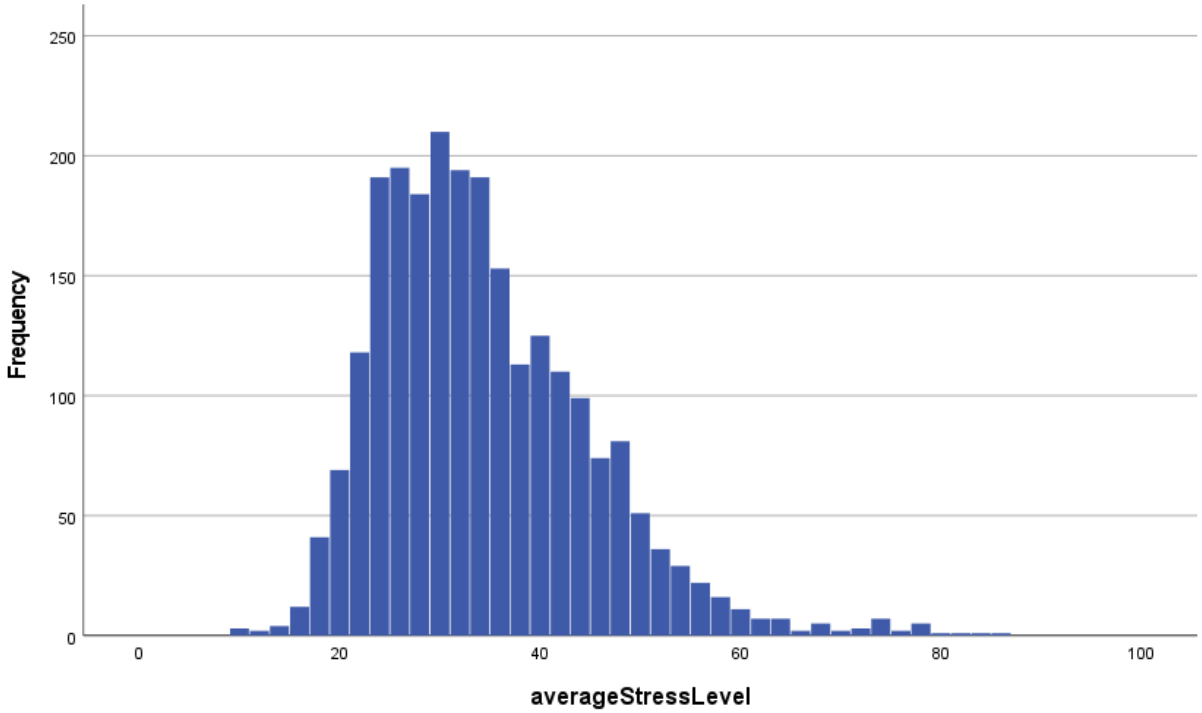


The second measure of stress provides a numeric average of the participant stress level over the course of the day, ranging from 0 (no stress) to 100 (always at maximum stress). The participant-level average stress across all study days ranged from 22.2 to 51.7 (**Table 25** and **Figure 34**).

Table 25. Average Stress Level per Day

Stress Level	Value (0–100)
Mean	33.9
SD	10.6
Minimum Value	10.0
Maximum Value	85.0

Figure 34. Distribution of Average Stress Level per Day



MDI Align Post-intervention Changes

This analysis section looks at the value differences in the pre-intervention and the post-intervention periods. As a general approach, all response intervals from all participants are pooled into a pre-post dichotomy, so we can examine the sample-level changes in outcomes. These analyses draw on the daily MDI Align surveys from the app as well as the change in stress and sleep quality over the course of the study period using inferential statistics. It is important to note that this design does not support causal statements, implicating the usage of the app content as solely responsible for any changes. Although there is value in examining any significant population-level differences in stress and sleep quality, the lack of control group or randomization positions this evaluation as a starting point for understanding the role of MDI-specific mobile app content in supporting wellness habits and positive health outcomes within the profession.

MDI Align (Pre-Post)

Stress

The availability and type of stress measurement in the MDI Align surveys was similar to that for sleep. There was a five-point Likert scale asking participants to rate their work and home stress from not at all stressful to extremely stressful. Using the same chi-square test approach, neither work stress (x = 4.369; p = .358) nor home stress (x = 2.346; p = .672) were significantly reduced after in the intervention period, according to the daily measures.

However, when we look at the participant level, where each participant is given a composite average of their stress rating and conduct a paired samples t-test on the 54 participants, we do see a statistically significant decrease in reported work stress (t = 2.112, *p* = .04) in the intervention period.

Stress Management

A series of chi-square tests were useful for examining differences in the level of engagement with work and home-based stress management techniques. As demonstrated in **Table 26** below, the only significant changes in stress management behaviors were related to behaviors directly addressed by the app content, which suggests that the lessons and content helped to improve those specific behaviors. There is a notable increase in meditation or yoga both at work and at home.

Table 26. Change in Engagement with Stress Management Behaviors

Resource/Strategy	Description of Change	Chi-Square Value
Work		
Critical Incident Stress Debriefing	No change	0.988; *p* = .320
Therapy/Counseling	No change	1.014; *p* = .314
Outside Gatherings with Colleagues	No change	0.897; *p* = .343
Coworker Lunches	Increase (4.2% → 8.2%)	9.086; *p* = .003
Informal Mentoring	No change	0.884; *p* = .347
Meditation/Yoga	Increase (1.3% → 5.9%)	18.331; *p* <.001
Exercise	Increase (0.5% → 2.0%)	5.244; *p* = .022
Peer Support Program	No change	0.033; *p* = .856
Sharing Accomplishments	No change	0.351; *p* = .554
Health Trainings	No change	0.044; *p* = .835
Stress Trainings	Increase (0.2% → 1.5%)	5.844; *p* = .016
Other	No change	0.019; *p* = .889
Home		
Zoning Out (TV, internet, napping)	No change	3.080; *p* = .079
Avoiding Violent Media	No change	3.733; *p* = .053
Alcohol	No change	2.386; *p* = .122
Hobbies	No change	1.688; *p* = .194
Learning Skills	No change	0.020; *p* = .888
Meditation/Yoga	Increase (1.3% → 6.6%)	21.991; p<.001
Religion/Community	No change	2.453; *p* = .117
Exercise	No change	1.857; *p* = .173
Family Support	No change	2.739; *p* = .098

Resource/Strategy	Description of Change	Chi-Square Value
Friend Support	No change	3.624; *p* = .057
Socializing with Coworkers	No change	0.027; *p* = .869
Therapy/Counseling	No change	0.040; *p* = .842
Travel	No change	0.884; *p* = .347
Media Detox	No change	1.166; *p* = .280
Other	No change	0.000; *p* = .997

Sleep

To reduce participant burden in answering daily questions, both sleep quantity and quality were assessed with multiple-choice ordinal scales rather than requiring participants to estimate and enter the exact number of hours of sleep per 24-hour period. For sleep quantity, participants reported whether they slept for less than 4, 4–6, 6–8, or more than 8 hours in the previous 24-hour period. For sleep quality, they reported their sleep in the past 24 hours as very good, fairly good, fairly bad, or very bad. Chi-square tests were used to assess significant differences between baseline and intervention periods. The differences in these daily measures were not significant for sleep quantity or quality.

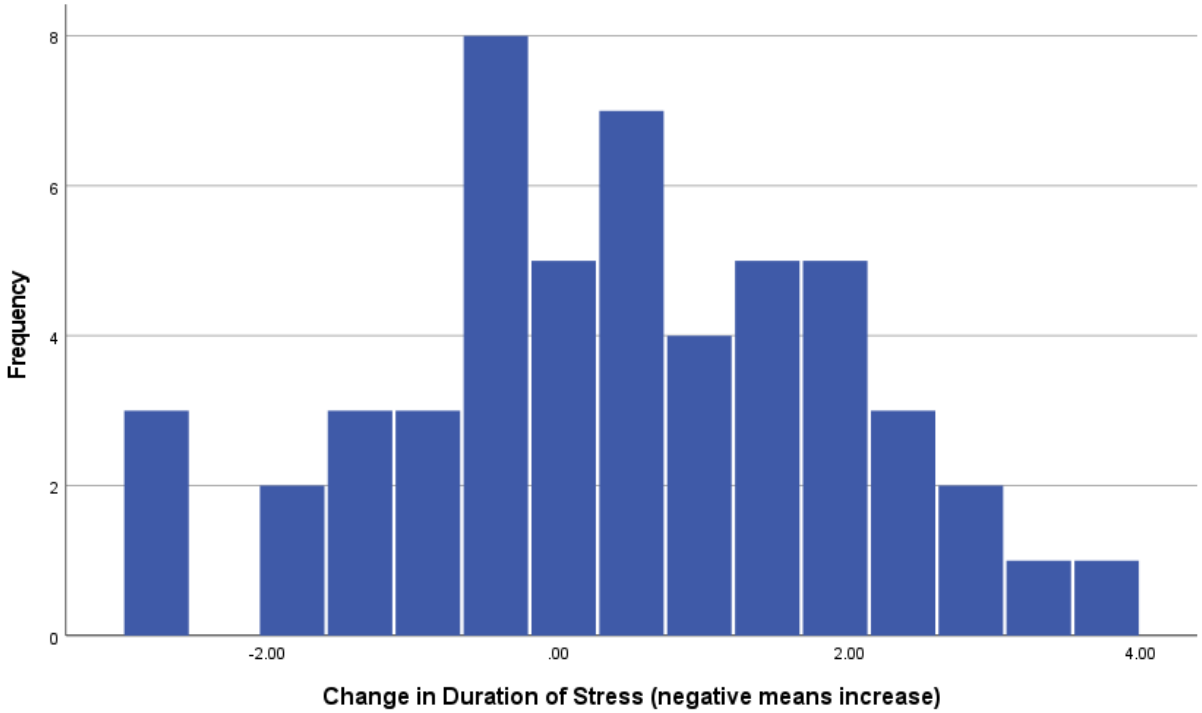
WRAP Biometrics (Pre-Post)

We can examine similar questions of pre-post differences in stress and sleep using the biometric data.

Stress

We conducted an independent samples t-test of the pooled daily stress duration. This analysis finds significant decrease in hours of stress in the post-intervention period, with the mean decreasing from 8.35 hours to 7.92, or 26 fewer minutes per day spent stressed (t = 2.443, *p* = .015). When limited to daily high-stress duration, the mean decreases from 1.11 to 1.00 hours of high stress in the post-intervention period; however, this is not statistically significant (t = 1.743, p = 0.082), and can likely be attributed to the low base rates of high-stress duration. Using a paired sample t-test results in similar outcomes, shown in **Figure 35** below.

Figure 35. Change in Daily Stress Duration



We conducted an independent samples t-test of the pooled average daily stress level. This analysis finds a small significant decrease in average level of stress in the post-intervention period, with the mean decreasing from 34.68 to 33.64 (t = 2.102, *p* = .036).

Sleep

We conducted an independent samples t-test of the pooled average daily sleep duration. This analysis found no significant difference between the pre-intervention period (7.84 hours), and the post-intervention period (7.75 hours).

3.4 Conclusion

To our knowledge, the impact study was the first of its kind to collect nuanced daily information from MDIs about their work and well-being, from both self-reported and biometric data. The pre- and post-intervention surveys showed that study participants reported fewer self-reported sleep problems and depression symptoms and increase coping self-efficacy (the sense that one can handle challenges when they arise). The biometric data showed a decrease in physiological stress, as measured by biometric HRV.

There were some inconsistencies in findings across data sources. For example, although self-reported sleep problems were reported to have lessened between baseline and post-intervention, improvements in sleep quantity or quality were not shown in the daily MDI Align surveys or the biometric data. This could be due to the difference in questions contained in the baseline and follow-up surveys, as compared to the questions in MDI Align. The longer survey contained questions from Pittsburgh Sleep Inventory, including questions about trouble falling

asleep and staying asleep. It could that participation in the intervention led to improvements in those specific areas but did not affect sleep more generally.

Discussions with pilot participants revealed that the simple act of reflecting on one's daily experiences of work and well-being (through engagement with the daily surveys) was helpful—perhaps as helpful as any of the other intervention components. The design of our study did not allow us to completely disentangle the effects of engagement with the MDI Align content (e.g., videos, guided meditations), with the effects of participating in the daily surveys. It may be the case that daily reflection (e.g., through silent reflection or journaling) alone could positively impact the wellness of MDIs, and this should be explored in future research.

4. Discussion

4.1 Contributions

Taken together, the findings of this study help illuminate the aspects of work that have the most detrimental impacts on MDIs, as well as promising solutions for mitigating their impacts. The national survey revealed that aspects of work that are inherent to the job create significant stress on the MDI community, such as difficult interactions with decedents' family members. Yet, many other aspects of work create stress for MDIs, such as organizational stressors, inadequate pay, fatigue, and lack of understanding or respect from political leaders, community members, and other stakeholders. A lack of work-related resources compounds these issues, with approximately one in five MDIs reporting they do not have access to any resources at work for addressing stress and wellness. Those who do have access to resources and have used them differ in their perceptions of the tools' effectiveness. MDIs face unique challenges, and resources for MDIs need to be tailored to the profession, or at least take into account their job-specific stressors and needs.

4.2 Study Limitations

As described in the results of the impact study, it was difficult to measure intervention dosage because many participants reported accessing MDI Align content directly from YouTube (after initially accessing it through the app). We could not track these interactions with the content, so are limited in our ability to describe which content users engaged with the most and how much time they spent engaging with the content on a daily basis, and over the course of the study. The data we collected about in-app engagement is likely a large underestimate of overall engagement with the content. Future research should deliver intervention content in a more confined environment, to allow for more precise measurement.

As noted above, aspects of the study outside of the intended elements of the intervention may have affected participant perceptions and behavior. Answering daily questions about their work experiences and health seemed to have a positive impact on at least some participants, as shared in the pilot participant focus groups and open-ended follow-up survey questions in the main study. Similarly, the simple act of wearing a smartwatch and seeing daily step count, sleep quality and quantity, and heart rate may have motivated participants to engage in certain health behaviors or changed their perceptions about their well-being (either positively or negatively). Future research should attempt to tease apart the effects of these various components on participants' perceptions and well-being. For example, a study design could be implemented in which participants are randomized to multiple study groups—one that includes daily surveys and another that does not. A true control group could also be employed, in which some participants only take the baseline and follow-up surveys and do not participate in wellness content nor daily surveying.

4.3 Implications for MDIs

This study demonstrated that many causes of MDI stress are outside the factors that many would assume. Policies and practices that examine and improve MDI workload issues, staffing, and schedules, and educate stakeholders (such as public health professionals, political leaders, law enforcement, and community members) about the critical functions they serve would likely reduce experiences of stress and strain. The work-related resources viewed by MDIs as most effective were social in nature: peer support programs, formal mentoring, outside gatherings, informal gatherings during work time, and informal mentoring. Employers of MDIs should increase provision and access to socially oriented supports, including peer support programs, mentoring, and helping colleagues to connect through social events and opportunities to interact during the workday. Though sometimes challenging to implement, these are likely of enhanced importance among MDIs who work alone or work in rural areas. Future research and practice should examine how to support connection among MDIs who are often isolated in their work—such as through virtual offerings or time and resources for travel to MDI conferences and events. This study highlighted that MDIs face many challenges in their jobs. Most also love their jobs. In the focus groups that informed the national survey and in interactions with participants in the impact study, the research team heard that MDIs value supporting decedents' families in times of need, and are rewarded by providing information that informs public health knowledge and practice and can save lives. This incredibly important profession has been largely understudied in the scientific research community and neglected in important conversations. It is imperative that researchers and practitioners continue to partner to identify new ways to better support the MDI community, and to reduce work-related stress in this profession wherever possible.

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Appendix A: National Survey

[LANDING PAGE LANGUAGE]

Thank you for taking the time from your busy schedule and important work to complete this survey. This survey effort is part of a project led by RTI International titled, Understanding Work-Related Stress among Medicolegal Death Professionals: A National Survey, and is funded by the National Institute of Justice. The purpose of this survey is to increase knowledge about work-related stress, stress management, and overall mental health and well-being across individuals working in the field of Medicolegal Death Investigations. This is the first survey of its kind to examine the breadth and frequency of exposure to stressful and traumatic events, and outcomes in this workforce.

The critical information collected will result in a comprehensive data set that will be used to inform Medicolegal Death Investigators (MDIs) and their employing organization of how to better understand and support health and wellness, improve organizational outcomes and personal wellbeing, and inform future programs and preventative training to reduce and alleviate work-related stressors. This survey has been created in collaboration with MDIs from across the country from the American Board of Medicolegal Death Investigators (ABMDI) and the International Association of Coroners and Medical Examiners (IACME), who helped the study team refine the survey instrument to ensure meaningful, relevant, and timely results to serve the MDI community.

This survey should take about 15 minutes to complete. If you have previously completed this survey, please exit this window. We appreciate your time and response.

Are you a professional in the field of medicolegal death investigations? This includes analysts, scientific staff, and others working in this field, in addition to death investigators.

- ☐ Yes
- ☐ No

Do you work in the United States?

- ☐ Yes
- ☐ No

Before you decide whether you want to participate in this research study, we ask that you read this page so that you understand what you will be asked to do and why this study is important.

This study is being conducted by RTI International, an independent non-profit research organization (NIJ Grant # 2019-R2-CX-0027). This is a web-based survey that will take approximately 15 minutes. If you decide to participate, you will be asked a series of questions about your work, work-related stress, and health.

There are no direct benefits to you for participating in this survey. However, the results will help inform RTI and the MDI community about the greatest sources of stress in your work and how to develop programs for reducing work-related stress and improving overall health and wellness.

As you complete this survey, please keep in mind that:

- Your participation is completely voluntary
- You are not required to answer any of the questions
- You may use the "Previous" button to go back to a previous question in the survey (Do not use your browser back button as this might cause errors)
- If you have questions about the survey questions or any technical issues with the survey, please contact the Help Desk at MDIStressSurvey@rti.org

Privacy

No identifying information will be associated with your responses. Findings will only be reported in the aggregate.

We are not collecting names, email addresses, or any contact information from participants. ABMDI, IACME, other professional organizations, and your employer(s) will NOT know if you complete this survey. Choosing to participate will have no impact on your employment or certification status.

If you have any concerns or general questions about the research or your rights as a participant, please contact RTI International's Institutional Review Board (IRB) to speak to someone independent of the research team at 1-866-214-2043

Thank you very much for considering participating in this important study.

I have read the information provided above and have freely decided to participate in this research.

- Yes, I agree to participate in this research.
- No, I do not wish to participate in this research.

What is your job role? (Select all that apply)

- ○ Medicolegal Death Investigator (or coroner investigator)
- ○ Autopsy pathologist
- ○ Coroner/non-physician
- ○ Forensic toxicologist
- ○ Forensic analyst or chemist
- ○ Other scientific investigative support staff (e.g., anthropologist, histologist)

- ○ Administrative staff (e.g., administrative assistance, accountant)
- ○ Driver
- ○ Photographer
- ○ Other (Write in) _____

Work-Related Stress

This section contains questions related to stressors you encounter during your normal workday, as well as major events.

Job-Specific Stressors

Medical Examiner and Coroner Job Stressors Scale; Brondolo et al., 2012

Instructions: How stressful do you find each of the following?

Response Options: 4-point scale (1 = Not at all stressful, 2 = Slightly Stressful, 3 = Moderately Stressful 4 = Very much stressful) with an N/A Option

Experiencing conflict about a case with other agencies (e.g., law enforcement) at the scene or with a professional outside of my organization.

Experiencing a lack of respect from other emergency service or medical personnel.

Working with the media (e.g., providing updates on investigations).

Reports in the media questioning the judgement of an investigation or determination made about a case.

Giving death notifications to family members.

A family member is angry or aggressive towards me.

A family member is inconsolable, extremely distressed.

Several family members show up at once.

A family member calls repeatedly for information about the case.

Someone from the family or another person related to the case complains about the investigation or determination.

The office has no appropriate place for families to wait.

Our offices or laboratory spaces are uncomfortable or poorly maintained.

Worrying about the consequences of my professional judgments on other people's lives.

Switching my shifts (e.g., day shift to night shift to day shift).

Working more than 10 hours on consecutive days.

Working more than 24 hours in a row to complete work assignments.

Seeing or hearing about a traumatic case that will not get out of my head – including having experiences that trigger memories.

Having incomplete information available at the time of the autopsy.

Being exposed to a decedent who may have had an infectious disease.

The possibility of bringing home some infection or illness that might hurt my family.

Looking at images of decedents to clarify the information about a case.

Encountering different smells of bodies, including decay.

Not being able to discuss work experiences with my family (due to confidentiality and to prevent them from harm).

Being concerned that other people might be disturbed or misunderstand my work.

Having difficulty discussing issues I encounter at work with those outside of work or the field.

Having experienced the suicide of a colleague or someone else within the profession.

Possibility of suicides of my colleagues or others within my profession.

To what extent have your responses to the above questions overall been influenced by the Covid-19 Pandemic?

- Ratings above NOT AT ALL related to pandemic [If selected, move on to Case exposure]
- Ratings above due SOMEWHAT to pandemic
- Ratings above due MOSTLY to pandemic
- Ratings above due ENTIRELY to pandemic

You indicted that some of your responses from the previous question were impacted by COVID-19, please identify which items you were referring to below.

Experiencing conflict about a case with other agencies (e.g., law enforcement) at the scene or with a professional outside of my organization.

Experiencing a lack of respect from other emergency service or medical personnel.

Working with the media (e.g., providing updates on investigations).

Reports in the media questioning the judgement of an investigation or determination made about a case.

Giving death notifications to family members.

A family member is angry or aggressive towards me.

A family member is inconsolable, extremely distressed.

Several family members show up at once.

A family member calls repeatedly for information about the case.

Someone from the family, or another person related to the case, complains about the investigation or determination.

The office has no appropriate place for families to wait.

Our offices or laboratory spaces are uncomfortable or poorly maintained.

Worrying about the consequences of my professional judgments on other people's lives.

Switching my shifts (e.g., day shift to night shift to day shift).

Working more than 10 hours on consecutive days.

Working more than 24 hours in a row to complete work assignments.

Seeing or hearing about a traumatic case that will not get out of my head – including having experiences that trigger memories.

Having incomplete information available at the time of the autopsy.

Being exposed to a decedent who may have had an infectious disease.

The possibility of bringing home some infection or illness that might hurt my family.

Looking at images of decedents to clarify the information about a case.

Encountering different smells of bodies, including decay.

Not being able to discuss work experiences with my family (due to confidentiality and to prevent them from harm).

Being concerned that other people might be disturbed or misunderstand my work.

Having difficulty discussing issues I encounter at work with those outside of work or the field.

Experienced the suicide of a colleague or someone else within the profession.

Possibility of suicides of my colleagues or others within my profession.

Case Exposure

Adapted from Brondolo et al., 2012

Instructions: How frequently did you encounter the following cases in your work in the past 6 months?

Response Options: 4-point scale (1 = Never, 2 = Rarely, 3= About once per month, 4 = Several times per month)

Infant/Child Death

Infant Death Investigation

Drug Overdose Deaths

Suicide Investigation

Homicide Investigation

Death of Individual You Know

Death of Someone who Reminds You of Someone You Know

Death of Someone Similar to Yourself

Multiple Fatalities from the Same Family

Multiple Fatalities- Homicide

Multiple Fatalities – Accidental Death

Death in Custody

Police-Involved Death (e.g., shooting by law enforcement)

To what extent have your responses to the above questions overall been influenced by the Covid-19 Pandemic?

- Ratings above NOT AT ALL related to pandemic
- Ratings above due SOMEWHAT to pandemic
- Ratings above due MOSTLY to pandemic
- Ratings above due ENTIRELY to pandemic

Organizational MDI Stress Questionnaire

Adapted from Organizational Police Stress Questionnaire; McCreary & Thompson, 2006

Instructions: Below is a list of items that describe different aspects of being an MDI. For each item, please indicate how much stress it has caused you over the past 6 months.

Response Options: 7-point scale (1 = "No Stress at All", 4 = "Moderate Stress", 7 = "A Lot of Stress") with an N/A Option

Interactions with coworkers

The feeling that different rules apply to different people (e.g., favoritism)

Feeling like you always have to prove yourself to the organization

Excessive administrative duties

Changes in policy/legislature/leadership without proper notification or explanation

Staff shortages

Inadequate paid time off

Bureaucratic red tape

Experiencing pressure from local or state officials (e.g., local and/or state governments)

Lack of training on processes/procedures

Lack of training on new equipment

Perceived pressure to volunteer free time

Dealing with supervisors (e.g., inconsistent leadership styles)

Lack of opportunities for career advancement

Lack of resources or inadequate equipment

Lack of adequate benefits

Inadequate salary/pay (e.g., struggling to make ends meet or maintaining multiple jobs to supplement salary)

Being sick or injured and your coworkers having to work additional hours

Leaders overemphasizing the negatives (e.g., supervisor evaluations, public complaints of death investigation)

Internal investigations

Dealing with the court system, including providing depositions and/or court room testimony

Being held accountable for things beyond your control

To what extent have your responses to the above questions overall been influenced by the Covid-19 Pandemic?

- Ratings above NOT AT ALL related to pandemic
- Ratings above due SOMEWHAT to pandemic
- Ratings above due MOSTLY to pandemic
- Ratings above due ENTIRELY to pandemic

Operational MDI Stress Questionnaire

Adapted from Operational Police Stress Questionnaire; McCreary & Thompson, 2006

Instructions: Below is a list of items that describe different aspects of being an MDI. For each item, please indicate how much stress it has caused you over the past 6 months.

Response Options: 7-point scale (1 = "No Stress at All", 4 = "Moderate Stress" 7 = "A Lot of Stress")

Shift work

Working alone

Overtime demands

Managing multiple scenes at once or within the same shift

Work-related activities on days off (e.g., court, community events)

Traumatic events

Not enough time available to spend with friends and family

Handling complex/difficult cases

Eating healthy at work

Staying in good physical condition

Fatigue

Occupation-related health issues (e.g., back pain, exposure to disease)

Lack of understanding from political stakeholders
or community leaders about your work

Upholding a "higher image" in public

Limitations to your social life (e.g., who your friends are, where you socialize)

Feeling like you are always on the job

Friends / family feeling the effects of the stigma associated with your job

To what extent have your responses to the above questions overall been influenced by the Covid-19 Pandemic?

- Ratings above NOT AT ALL related to pandemic
- Ratings above due SOMEWHAT to pandemic
- Ratings above due MOSTLY to pandemic
- Ratings above due ENTIRELY to pandemic

Current Issues in Medicolegal Death Investigations: COVID-19

Instructions: Below is a list of items that describe potential stressors related to your work in the context of COVID-19. For each item, please indicate how much stress it has caused you over the past 6 months.

Response Options: 7-point scale (1 = "No Stress at All", 4 = "Moderate Stress", 7 = "A Lot of Stress") with an N/A Option

Direct exposure to COVID-19 through daily work activities

Being unable to work due to possible or confirmed exposure to COVID-19

Lack of access to adequate personal protective equipment (PPE)

Inability to access necessary number of COVID tests

Lack of guidance around revised procedures

Inability to change procedures to keep up with rapidly changing recommended guidance

Increased requests from families (e.g., to run more tests)

Lack of training on how to handle positive COVID-19 cases

Having to work from home

Changes to communications within the office due to telecommuting

Receiving fewer/less adequate accommodations than other first responders

Facilities refusing to accept bodies that are positive or pending testing

Difficulty communicating with families (e.g., due to reduced contact / physical distancing)

Higher caseload than normal

Additional staffing shortages / reduced staffing due to COVID-19 specific situations

Have you been vaccinated with at least one round of the COVID-19 vaccine?

1. Yes
2. No
3. Prefer not to answer

Health & Well-Being Outcomes

This next section contains questions about your health and wellbeing. When answering these questions, keep in mind how often the experiences have occurred in the past ONE MONTH.

Sleep Quality

Pittsburgh Sleep quality Index (Selected items); Buysse et al., 1989

Instructions: Over the past ONE MONTH, how often have you been bothered by any of the following problems?

Response Options (Items 1 & 2): 5-point scale (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always)

Response Options (Item 3): 5-point scale (1 = Very poor, 2 = Poor, 3 = Fair, 4 = Good, 5 = Very good)

Had trouble falling asleep (i.e., you could not get to sleep within 30 minutes)

Had trouble staying asleep (i.e., you wake up in the middle of the night or early morning)

How would you rate your sleep quality overall?

To what extent have your responses to the above questions overall been influenced by the Covid-19 Pandemic?

- Ratings above NOT AT ALL related to pandemic
- Ratings above due SOMEWHAT to pandemic
- Ratings above due MOSTLY to pandemic
- Ratings above due ENTIRELY to pandemic

You indicted that some of your responses from the previous question were impacted by COVID-19, please identify which items you were referring to below.

Had trouble falling asleep (i.e., you could not get to sleep within 30 minutes)

Had trouble staying asleep (i.e., you wake up in the middle of the night or early morning)

How would you rate your sleep quality overall?

Burnout

Maslach Burnout Inventory; Maslach et al., 1986

Instructions: Please read each of the following statements and choose how much you agree or disagree with each one.

Response Options: 5-point scale (1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree)

I feel emotionally drained from my work.

I feel depleted or exhausted at the end of the workday.

I feel fatigued when I get up in the morning and have to face another day on the job.

I can easily understand how people I encounter in my work feel about things.

I feel I treat some people I encounter in my work as if they were impersonal objects.

Working with people all day is really a strain for me.

I feel burned out from my work.

I feel I'm positively influencing other people's lives through my work.

I've become more callous toward people since I took this job.

I worry that this job is causing me to become emotionally detached.

I feel very energetic.

I feel frustrated by my job.

I feel I'm working too hard on my job.

I don't really care what happens to some people I encounter in my work.

Working with grieving family members puts too much stress on me.

I can easily create a relaxed atmosphere with people I encounter in my work.

I feel exhilarated after working closely with people I encounter in my work.

I have accomplished many worthwhile things in this job.

I feel like I'm at the end of my rope.

In my work, I deal with emotional problems very calmly.

I feel people I encounter in my work blame me for some of their problems.

To what extent have your responses to the above questions overall been influenced by the Covid-19 Pandemic?

- Ratings above NOT AT ALL related to pandemic
- Ratings above due SOMEWHAT to pandemic
- Ratings above due MOSTLY to pandemic
- Ratings above due ENTIRELY to pandemic

You indicted that some of your responses from the previous question were impacted by COVID-19, please identify which items you were referring to below.

I feel emotionally drained from my work.

I feel depleted or exhausted at the end of the workday.

I feel fatigued when I get up in the morning and have to face another day on the job.

I can easily understand how people I encounter in my work feel about things.

I feel I treat some people I encounter in my work as if they were impersonal objects.

Working with people all day is really a strain for me.

I feel burned out from my work.

I feel I'm positively influencing other people's lives through my work.

I've become more callous toward people since I took this job.

I worry that this job is causing me to become emotionally detached.

I feel very energetic.

I feel frustrated by my job.

I feel I'm working too hard on my job.

I don't really care what happens to some people I encounter in my work.

Working with grieving family members puts too much stress on me.

I can easily create a relaxed atmosphere with people I encounter in my work.

I feel exhilarated after working closely with people I encounter in my work.

I have accomplished many worthwhile things in this job.

I feel like I'm at the end of my rope.

In my work, I deal with emotional problems very calmly.

I feel people I encounter in my work blame me for some of their problems.

Compassion Fatigue

Professional Quality of Life Scale: Version 5; Stamm, 2009

Instructions: Select the response that honestly reflects how frequently you experienced these things in the past ONE MONTH.

Response Options: 5-point scale (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Very Often)

I am happy.

I get satisfaction from being able to help people.

I feel I can connect with others.

I jump or am startled by unexpected sounds.

I feel invigorated after working with people I encounter through my job.

I think that I might have been affected by the traumatic stress of people I encounter in my work.

I feel trapped in this job role.

I like my work as a medicolegal death professional or ME/C.

I feel as though I am experiencing the trauma of someone I have encountered in my work.

I have beliefs that sustain me.

I am pleased with how I am able to keep up with techniques and protocols in this profession.

I am the person I always wanted to be.

My work makes me feel satisfied.

I feel worn out because of my work as a medicolegal death professional or ME/C.

I have happy thoughts and feelings about those I encounter in my work and how I could help them.

I feel overwhelmed because my caseload seems endless.

I believe I can make a difference through my work.

I avoid certain activities or situations because they remind me of frightening experiences of the people I encounter in my work.

I am proud of what I can do to help as a medicolegal death professional or ME/C.

As a result of my work, I have intrusive, frightening thoughts.

I feel “bogged down” by the system.

I have thoughts that I am a “success” as a medicolegal death professional or ME/C.

I can’t recall important parts of my cases.

I am a very caring person.

I am happy that I chose to do this work.

To what extent have your responses to the above questions overall been influenced by the Covid-19 Pandemic?

- Ratings above NOT AT ALL related to pandemic
- Ratings above due SOMEWHAT to pandemic
- Ratings above due MOSTLY to pandemic

- Ratings above due ENTIRELY to pandemic

Depression

CES-D; Bohannon et al., 2003

Instructions: Please indicate how you have felt during the past ONE MONTH.

Response Options: 4-point scale (1 = Rarely or none of the time, 2 = Some or a little of the time, 3 = A moderate amount of time, 4 = Most or all of the time)

I have had feelings of depression.

My sleep is restless.

I have felt lonely.

I have had crying spells.

I have a hard time motivating myself

To what extent have your responses to the above questions overall been influenced by the Covid-19 Pandemic?

- Ratings above NOT AT ALL related to pandemic
- Ratings above due SOMEWHAT to pandemic
- Ratings above due MOSTLY to pandemic
- Ratings above due ENTIRELY to pandemic

Anxiety

Generalized Anxiety Disorder Assessment (GAD-7); Spitzer et al., 2006

Instructions: Over the past ONE MONTH, how often have you been bothered by any of the following problems?

Response Options: 4-point scale (1 = Not at all, 2 = Several days, 3 = More than half the days, 4 = Nearly every day)

I have had feelings of nervousness or anxiousness

I have not been able to stop or control worrying

I find myself worrying too much about different things

I have had trouble relaxing

I have felt so restless that it is hard to sit still

I easily become annoyed or irritable

I have been feeling afraid as if something awful might happen

To what extent have your responses to the above questions overall been influenced by the Covid-19 Pandemic?

- Ratings above NOT AT ALL related to pandemic

- Ratings above due SOMEWHAT to pandemic
- Ratings above due MOSTLY to pandemic
- Ratings above due ENTIRELY to pandemic

Post-traumatic Stress Disorder

PTSD Short-form Checklist Zuromski et al., 2019

Instructions: In the past <u>ONE MONTH</u>, how much were you bothered by the following?

Response Options: 5-point scale (0 = Not at all, 1 = A little bit, 2 = Moderately, 3 = Quite a bit, 4 = Extremely)

I suddenly feel or act as if a stressful experience were actually happening again (as if you were actually back there reliving it)

I avoid external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?

I feel distant or cut off from other people

I have irritable behavior, angry outbursts, or acting aggressively

To what extent have your responses to the above questions overall been influenced by the Covid-19 Pandemic?

- Ratings above NOT AT ALL related to pandemic
- Ratings above due SOMEWHAT to pandemic
- Ratings above due MOSTLY to pandemic
- Ratings above due ENTIRELY to pandemic

Personal Resources

This next section contains questions about your personal experiences and behaviors. When answering these questions, think about your experiences <u>IN GENERAL</u>.

Coping Self-Efficacy

Coping Self-Efficacy Scale; Chesney et al., 2006

Instructions: Please respond to the following questions about your experiences in GENERAL.

When things aren't going well for you, or when you are having problems, how confident or certain are you that you can do the following?

Response Options: 5-point scale (1 = Not at all confident, 2 = Only slightly confident, 3 = Somewhat confident, 4 = Moderately confident, 5 = Very confident)

Break an upsetting problem down into smaller parts

Sort out what can be changed, and what cannot be changed

Make a plan of action and follow it when confronted with a problem

Leave options open when things get stressful

Think about one part of the problem at a time

Find solutions to your most difficult problems

Take your mind off unpleasant thoughts

Stop yourself from being upset by unpleasant thoughts

Keep from feeling sad

Get friends to help you with the things you need

Get emotional support from coworkers

Get emotional support from family outside of work

Mindfulness

Mindfulness Attention Awareness Scale; Brown & Ryan, 2003

Instructions: Below is a collection of statements about your everyday experience. Using the scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

Response Options: 5-point scale (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always)

I could be experiencing some emotion and not be conscious of it until sometime later.

I break or spill things because of carelessness, not paying attention, or thinking of something else.

I find it difficult to stay focused on what's happening in the present.

I tend to walk quickly to get where I am going without paying attention to what I experience along the way.

I tend not to notice feelings of physical tension or discomfort until they really grab my attention.

I forget a person's name almost as soon as I have been told it for the first time.

I rush through activities without being really attentive to them.

I get so focused on the goal I want to achieve that I lose touch with what I am doing right now to get there.

I do jobs or tasks automatically, without being aware of what I am doing.

I drive places on "automatic pilot" and then wonder why I went there.

I find myself preoccupied with the future or the past.

I find myself doing things without paying attention.

I snack without being aware that I am eating.

Stress Management at Work

This next set of questions asks about resources offered through your work to help you manage stress.

Stress Management Resources/Strategies at Work

Instructions: Please respond to the following questions about resources or strategies utilized by your workplace to alleviate stress and/or improve mental health.

Check all that are applicable.

Response Options: Indicate (1) whether each is offered currently (Yes/No), (2) if offered, whether personally used (Yes/No), and (3) if used, how effective on a 5-point scale (1 = Not at all effective, 2 = Slightly effective, 3 = Somewhat effective, 4 = Very effective, 5 = Extremely effective)

Opportunities to exercise during the workday (e.g., on-site equipment or exercise facilities)

Trainings related to physical health/wellbeing

Trainings related to stress management/mental health

Meditation, yoga, or mindfulness training

Employer-provided therapy or counseling (e.g., meetings with an on-site psychologist, counseling through an Employee Assistance Provider [EAP])

Critical Incident Stress Debriefing

Formal mentoring program

Informal mentoring

Peer Support Program

Gatherings with colleagues outside of work time (e.g., parties, barbecues)

Informal gatherings with colleagues during work time (e.g., lunches)

Sharing work and/or personal accomplishments and announcements (e.g., through a newsletter, announcements, website, etc.)

Other (Please Describe) _____

Other (Please Describe) _____

Other (Please Describe) _____

Barriers to Addressing Stress at Work

Instructions: To what extent do you think each of the follow is a barrier to your office or agency addressing stress and mental health among its employees?

Response Options: 5-point scale (1 = Not at all a barrier, 2 = Slight barrier, 3 = Somewhat a barrier, 4 = Moderate barrier, 5 = Extreme barrier)

Lack of awareness/understanding from management of the issues

Lack of agency/supervisor knowledge on how to effectively manage stress and mental health issues

Stigma around acknowledging mental health issues (e.g., “You signed up for this”)

Lack of adequate workplace training on stress management

Having to use sick or vacation time to utilize resources (e.g., see a counselor)

Lack of accessible/convenient resources (e.g., counselors in convenient locations, resources that are open when you need them)

Lack of therapists/counselors who understand and can handle the unique needs and experiences of medicolegal death professional or ME/Cs.

Personal (Non-work) Stress Management

Instructions: Please respond to the following questions about resources or strategies you use outside of work to alleviate stress and/or improve mental health.

Response Options: Indicate (1) whether each is personally used (Yes/No), (2) if used, how effective on a 5-point scale (1 = Extremely ineffective, 2 = Ineffective, 3 = Neither effective nor ineffective, 4 = Effective, 5 = Extremely effective)

Physical exercise

Meditation, yoga, or mindfulness

Engaging in hobbies

Therapy or counseling

Learning something new/mastering a new skill

Avoiding news or media (e.g., books, movies, TV) that contain death/violence

Seeking support from family

Seeking support from friends

Socializing with work friends outside of work time

Participation in religious or other community groups

Travel/vacation

Volunteering

Eliminating or reducing exposure to media (“electronic detox”)

“Zoning out” or detaching from reality (e.g., by watching TV, surfing the internet, napping)

Drinking alcohol

Other (Please Describe) _____

Other (Please Describe) _____

Other (Please Describe) _____

What else would you like to tell us about work-related stress in your profession that we haven’t already covered?_____

Information about You and Your Office

Instructions

We are collecting the following information to better understand how work-related stress affects MDIs in different types of jobs and situations. It will NOT be used to identify any individuals and will only be reported in the aggregate.

1. How long have you worked in your current job role?

1. How many cases/investigations do you work on or oversee per week (on average)?

2. Select the best description of your office. Select only <u>one</u> option.

- ○ A. State medical examiner office
- ○ B. District/regional medical examiner office
- ○ C. County medical examiner office
- ○ D. City medical examiner office
- ○ E. County coroner office
- ○ F. District/regional coroner office
- ○ G. Private autopsy facility serving the medical examiner/coroner community
- ○ H. None of the above

3. What level of government best describes your office?

- City office
- County office
- District/regional office
- State office

4. Which of the following best describes the agency your office reports to or is part of?

- Public health agency (e.g., department or division of public health)
- Law enforcement agency (e.g., department or division of public safety)
- Government attorney's office (e.g., district attorney)
- County level government office
- Department or division of forensic science
- My office does not report to another agency
- Other (please specify)

5. What jurisdiction(s) does your office serve (e.g., State of North Carolina; Orange County, Florida; New York City; First Judicial District)?

6. Please select the state that your office operates in. (All 50 states plus DC drop down)

7. What are the responsibilities of your MDI office? Select <u>all</u> that apply.

- ☐ A. Determine the cause and manner of death
- ☐ B. Conduct inquests
- ☐ C. Assist medical examiners in death investigations
- ☐ D. Move the decedent from location of death
- ☐ E. Order toxicology testing
- ☐ F. Execute arrest warrants and serve process
- ☐ G. None of the above

8. What is your age?

- Under 18
- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 or older
- Prefer not to answer

9. What is your gender?

- Male
- Female
- Other
- Prefer not to answer

10. How would you describe yourself? *Select all that apply.*

- White
- Hispanic, Latino, or Spanish origin
- Black or African American
- Asian
- American Indian or Alaska Native
- Middle Eastern or North African
- Native Hawaiian or Other Pacific Islander
- Other race, ethnicity, or origin
  Specify: [TEXT BOX 30 CHARACTERS]
- Prefer not to answer

11. What is the highest level of education you have completed?

- High school diploma/GED
- Some college
- Associate degree (AA, AS, AAS)
- Bachelor's degree (BA, BS, BFA, BAS)
- Master's degree (MA, MS, MBA, MPH)
- Doctoral or Professional Degree (PhD, JD, MD)
- Prefer not to answer

Appendix B: Pre and Post Survey Impact Study Measures

[LANDING PAGE LANGUAGE]

Thank you for taking the time from your busy schedule and important work to participate in this study. This effort is part of a project led by RTI International titled, *Understanding Work-Related Stress among Medicolegal Death Professionals,* and is funded by the National Institute of Justice. The purpose of this study is to increase knowledge about work-related stress, stress management, and overall mental health and well-being across individuals working in the field of Medicolegal Death Investigations.

This survey serves as a baseline measure for the impact study, which will assess the effects of daily work activities and use of a stress-reduction app on MDIs' health and wellness. This survey should take about 15 minutes to complete. **As you complete this survey, please keep in mind that:**

- Your participation is completely voluntary
- You are not required to answer any of the questions
- You may use the "Previous" button to go back to a previous question in the survey (Do not use your browser back button as this might cause errors)
- If you have questions about the survey questions or any technical issues with the survey, please contact the Help Desk at MDIStressSurvey@rti.org

Please enter the participant ID assigned to you in your onboarding packet: _____

What is your job role?

- ○ Medicolegal Death Investigator (or coroner investigator)
- ○ Autopsy pathologist
- ○ Coroner/non-physician
- ○ Forensic toxicologist
- ○ Forensic analyst or chemist
- ○ Other scientific investigative support staff (e.g., anthropologist, histologist)
- ○ Administrative staff (e.g., administrative assistance, accountant)
- ○ Driver
- ○ Photographer
- ○ Other (Write in) _____

Work-Related Stress

This section contains questions related to stressors you encounter during your normal workday, as well as major events.

Job-Specific Stressors

Medical Examiner and Coroner Job Stressors Scale; Brondolo et al., 2012

Instructions: How stressful do you find each of the following?

Response Options: 4-point scale (1 = Not at all stressful, 2 = Slightly Stressful, 3 = Moderately Stressful 4 = Very much stressful) with an N/A Option

Experiencing conflict about a case with other agencies (e.g., law enforcement) at the scene or with a professional outside of my organization.

Experiencing a lack of respect from other emergency service or medical personnel.

Working with the media (e.g., providing updates on investigations).

Reports in the media questioning the judgement of an investigation or determination made about a case.

Giving death notifications to family members.

A family member is angry or aggressive towards me.

A family member is inconsolable, extremely distressed.

Several family members show up at once.

A family member calls repeatedly for information about the case.

Someone from the family or another person related to the case complains about the investigation or determination.

The office has no appropriate place for families to wait.

Our offices or laboratory spaces are uncomfortable or poorly maintained.

Worrying about the consequences of my professional judgments on other people's lives.

Switching my shifts (e.g., day shift to night shift to day shift).

Working more than 10 hours on consecutive days.

Working more than 24 hours in a row to complete work assignments.

Seeing or hearing about a traumatic case that will not get out of my head – including having experiences that trigger memories.

Having incomplete information available at the time of the autopsy.

Being exposed to a decedent who may have had an infectious disease.

The possibility of bringing home some infection or illness that might hurt my family.

Looking at images of decedents to clarify the information about a case.

Encountering different smells of bodies, including decay.

Not being able to discuss work experiences with my family (due to confidentiality and to prevent them from harm).

Being concerned that other people might be disturbed or misunderstand my work.

Having difficulty discussing issues I encounter at work with those outside of work or the field.

Having experienced the suicide of a colleague or someone else within the profession.

Possibility of suicides of my colleagues or others within my profession.

Case Exposure

Adapted from Brondolo et al. 2012

Instructions: How frequently did you encounter the following cases in your work in the past 6 months?

Response Options: 4-point scale (1 = Never, 2 = Rarely, 3= About once per month, 4 = Several times per month)

Infant/Child Death
Infant Death Investigation
Drug Overdose Deaths
Suicide Investigation
Homicide Investigation
Death of Individual You Know
Death of Someone who Reminds You of Someone You Know
Death of Someone Similar to Yourself
Multiple Fatalities from the Same Family
Multiple Fatalities- Homicide
Multiple Fatalities – Accidental Death
Death in Custody
Police-Involved Death (e.g., shooting by law enforcement)

Organizational MDI Stress Questionnaire

Adapted from Organizational Police Stress Questionnaire; McCreary & Thompson, 2006

Instructions: Below is a list of items that describe different aspects of being an MDI. For each item, please indicate how much stress it has caused you over the past 6 months.

Response Options: 7-point scale (1 = "No Stress at All", 4 = "Moderate Stress", 7 = "A Lot of Stress") with an N/A Option

Interactions with coworkers
The feeling that different rules apply to different people (e.g., favoritism)
Feeling like you always have to prove yourself to the organization
Excessive administrative duties
Changes in policy/legislature/leadership without proper notification or explanation
Staff shortages
Inadequate paid time off
Bureaucratic red tape
Experiencing pressure from local or state officials (e.g., local and/or state governments)
Lack of training on processes/procedures
Lack of training on new equipment
Perceived pressure to volunteer free time

Dealing with supervisors (e.g., inconsistent leadership styles)

Lack of opportunities for career advancement

Lack of resources or inadequate equipment

Lack of adequate benefits

Inadequate salary/pay (e.g., struggling to make ends meet or maintaining multiple jobs to supplement salary)

Being sick or injured and your coworkers having to work additional hours

Leaders overemphasizing the negatives (e.g., supervisor evaluations, public complaints of death investigation)

Internal investigations

Dealing with the court system, including providing depositions and/or court room testimony

Being held accountable for things beyond your control

Operational MDI Stress Questionnaire

Adapted from Operational Police Stress Questionnaire; McCreary & Thompson, 2006

Instructions: Below is a list of items that describe different aspects of being an MDI. For each item, please indicate how much stress it has caused you over the past 6 months.

Response Options: 7-point scale (1 = "No Stress at All", 4 = "Moderate Stress" 7 = "A Lot of Stress")

Shift work

Working alone

Overtime demands

Managing multiple scenes at once or within the same shift

Work-related activities on days off (e.g., court, community events)

Traumatic events

Not enough time available to spend with friends and family

Handling complex/difficult cases

Eating healthy at work

Staying in good physical condition

Fatigue

Occupation-related health issues (e.g., back pain, exposure to disease)

Lack of understanding from political stakeholders
or community leaders about your work

Upholding a "higher image" in public

Limitations to your social life (e.g., who your friends are, where you socialize)

Feeling like you are always on the job

Friends / family feeling the effects of the stigma associated with your job

Current Issues in Medicolegal Death Investigations: COVID-19

New items developed based on practitioner subject matter expert input

Instructions: Below is a list of items that describe potential stressors related to your work in the context of COVID-19. For each item, please indicate how much stress it has caused you over the past 6 months.

Response Options: 7-point scale (1 = "No Stress at All", 4 = "Moderate Stress", 7 = "A Lot of Stress") with an N/A Option

- Direct exposure to COVID-19 through daily work activities
- Being unable to work due to possible or confirmed exposure to COVID-19
- Lack of access to adequate personal protective equipment (PPE)
- Inability to access necessary number of COVID tests
- Lack of guidance around revised procedures
- Inability to change procedures to keep up with rapidly changing recommended guidance
- Increased requests from families (e.g., to run more tests)
- Lack of training on how to handle positive COVID-19 cases
- Having to work from home
- Changes to communications within the office due to telecommuting
- Receiving fewer/less adequate accommodations than other first responders
- Facilities refusing to accept bodies that are positive or pending testing
- Difficulty communicating with families (e.g., due to reduced contact / physical distancing)
- Higher caseload than normal
- Additional staffing shortages / reduced staffing due to COVID-19 specific situations

Health & Well-Being Outcomes

This section contains questions about your health and wellbeing. When answering these questions, keep in mind how often the experiences have occurred in the past **ONE MONTH**.

Sleep Quality

Pittsburgh Sleep quality Index (Selected items); Buysse et al., 1989

Instructions: Over the past ONE MONTH, how often have you been bothered by any of the following problems?

Response Options (Items 1 & 2): 5-point scale (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always)

Response Options (Item 3): 5-point scale (1 = Very poor, 2 = Poor, 3 = Fair, 4 = Good, 5 = Very good)

Had trouble falling asleep (i.e., you could not get to sleep within 30 minutes)

Had trouble staying asleep (i.e., you wake up in the middle of the night or early morning)

How would you rate your sleep quality overall?

Burnout

Maslach Burnout Inventory; Maslach et al., 1986

Instructions: Please read each of the following statements and choose how much you agree or disagree with each one.

Response Options: 5-point scale (1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree)

I feel emotionally drained from my work.

I feel depleted or exhausted at the end of the workday.

I feel fatigued when I get up in the morning and have to face another day on the job.

I can easily understand how people I encounter in my work feel about things.

I feel I treat some people I encounter in my work as if they were impersonal objects.

Working with people all day is really a strain for me.

I feel burned out from my work.

I feel I'm positively influencing other people's lives through my work.

I've become more callous toward people since I took this job.

I worry that this job is causing me to become emotionally detached.

I feel very energetic.

I feel frustrated by my job.

I feel I'm working too hard on my job.

I don't really care what happens to some people I encounter in my work.

Working with grieving family members puts too much stress on me.

I can easily create a relaxed atmosphere with people I encounter in my work.

I feel exhilarated after working closely with people I encounter in my work.

I have accomplished many worthwhile things in this job.

I feel like I'm at the end of my rope.

In my work, I deal with emotional problems very calmly.

I feel people I encounter in my work blame me for some of their problems.

Compassion Fatigue

Professional Quality of Life Scale: Version 5; Stamm, 2009

Instructions: Select the response that honestly reflects how frequently you experienced these things in the past <u>ONE MONTH</u>.

Response Options: 5-point scale (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Very Often)

I am happy.

I get satisfaction from being able to help people.

I feel I can connect with others.

I jump or am startled by unexpected sounds.

I feel invigorated after working with people I encounter through my job.

I think that I might have been affected by the traumatic stress of people I encounter in my work.

I feel trapped in this job role.

I like my work in this profession.

I feel as though I am experiencing the trauma of someone I have encountered in my work.

I have beliefs that sustain me.

I am pleased with how I am able to keep up with techniques and protocols in this profession.

I am the person I always wanted to be.

My work makes me feel satisfied.

I feel worn out because of my work in this profession.

I have happy thoughts and feelings about those I encounter in my work and how I could help them.

I feel overwhelmed because my caseload seems endless.

I believe I can make a difference through my work.

I avoid certain activities or situations because they remind me of frightening experiences of the people I encounter in my work.

I am proud of what I can do to help in this profession.

As a result of my work, I have intrusive, frightening thoughts.

I feel “bogged down” by the system.

I have thoughts that I am a “success” in my job role.

I can’t recall important parts of my cases.

I am a very caring person.

I am happy that I chose to do this work.

Anger

(Anger Short-Form; Pilkonis et al., 2011)

Please respond to each question or statement by selecting the response that best reflects your experience.

In the past <u>ONE MONTH</u>:

Response Options: 5-point scale (1 = never, 5 = always)

I was irritated more than people knew

I felt angry

I felt like I was ready to explode

I was grouchy

I felt annoyed

Depression

CES-D; Bohannon et al., 2003

Instructions: Please indicate how you have felt during the past ONE MONTH.

Response Options: 4-point scale (1 = Rarely or none of the time, 2 = Some or a little of the time, 3 = A moderate amount of time, 4 = Most or all of the time)

I have had feelings of depression.

My sleep is restless.

I have felt lonely.

I have had crying spells.

I have a hard time motivating myself

Anxiety

Generalized Anxiety Disorder Assessment (GAD-7); Spitzer et al., 2006

Instructions: Over the past ONE MONTH, how often have you been bothered by any of the following problems?

Response Options: 4-point scale (1 = Not at all, 2 = Several days, 3 = More than half the days, 4 = Nearly every day)

I have had feelings of nervousness or anxiousness

I have not been able to stop or control worrying

I find myself worrying too much about different things

I have had trouble relaxing

I have felt so restless that it is hard to sit still

I easily become annoyed or irritable

I have been feeling afraid as if something awful might happen

Resilience

(Smith et al., 2008)

Response Options: 5-point scale (1 = strongly disagree, 5 = strongly agree)

Instructions: **Please respond to the following questions about your experiences in the PAST 1 MONTH.**

I tend to bounce back quickly after hard times
I have a hard time making it through stressful events
It does not take me long to recover from a stressful event
It is hard for me to snap back when something bad happens

I usually come through difficult times with little trouble
I tend to take a long time to get over set-backs in my life

Post-Traumatic Stress Disorder

PTSD Short-form Checklist Zuromski et al., 2019

Instructions: In the past <u>ONE MONTH</u>, how much were you bothered by the following?

Response Options: 5-point scale (0 = Not at all, 1 = A little bit, 2 = Moderately, 3 = Quite a bit, 4 = Extremely)

I suddenly feel or act as if a stressful experience were actually happening again (as if you were actually back there reliving it)

I avoid external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?

I feel distant or cut off from other people

I have irritable behavior, angry outbursts, or acting aggressively

General Health

(Single item from the SF-12 Physical Health Composite; Short-Form Health Survey; Ware, Kosinski, & Keller, 1996)

Please select the response that best reflects your experience.

In general, would you say your health is:

( ) Poor

( ) Fair

( ) Good

( ) Very Good

( ) Excellent

Lifestyle Questions

(Olsen & Keuhl, 2011)

In the past month, how often did you consume a drink (or pill) with about 100mg caffeine or other energy ingredient (8 oz. coffee, 16 oz. tea, 20 oz. soda/energy drink, one caffeine/energy pill)?

Never
1 to 3 per month
1 per week
2 to 4 per week

5 to 6 per week
1 per day
2 to 3 per day
4 to 5 per day
6 or more per day

In the past 7 days, have you smoked any cigarettes?

Yes
No

If Yes: During the past month, on days when you smoked, about how many cigarettes did you smoke?

1-19
20
21 or more

In the last 7 days, have you used any other tobacco products (chew, snuff, cigars)?

Yes
No

In the past month, how many alcoholic drinks have you had?

None
1 to 3 in the past month
1 per week
2 to 4 in per week
5 to 6 per week
1 per day
2 to 3 per day
4 to 5 per day
6 or more per day

Health and Wellness

(National Research Platform Sub-Scale, 2017)

Response Options: 4-point scale (1 = not at all, 2 = infrequently, 3 = frequently, 4 = always [plus N/A option])

I focus on:

Eating healthy (e.g., vegetables, fruits, whole grains, high quality protein)
Getting enough rest/sleep
Getting undisrupted sleep
Getting regular physical exams
Physical training or exercise
Quiet relaxation

Reducing alcohol use
Reducing caffeine intake (e.g., coffee, energy drinks, soda)
Reducing or quitting smoking
Maintaining a healthy weight
Seeking emotional support (e.g., clergy, friends, family, peers, mental health professionals)
Stress reduction activities

Attitudes & Personal Resources

This next section contains questions about your personal experiences and behaviors. When answering these questions, think about your experiences **IN GENERAL**.

Job Satisfaction

(Michigan Organizational Assessment Questionnaire [MOAQ]; Cammann et al., 1983)

Please indicate how much you agree or disagree with each statement **IN GENERAL**.

Response Options: 5-point scale (1 = strongly disagree, 5 = strongly agree)

In general, you like working at your job
In general, you are satisfied with your job

You are generally satisfied with the kind of work you do

Coping Self-Efficacy

Coping Self-Efficacy Scale; Chesney et al., 2006

Instructions: Please respond to the following questions about your experiences in GENERAL.

When things aren't going well for you, or when you are having problems, how confident or certain are you that you can do the following?

Response Options: 5-point scale (1 = Not at all confident, 2 = Only slightly confident, 3 = Somewhat confident, 4 = Moderately confident, 5 = Very confident)

Break an upsetting problem down into smaller parts
Sort out what can be changed, and what cannot be changed
Make a plan of action and follow it when confronted with a problem
Leave options open when things get stressful
Think about one part of the problem at a time
Find solutions to your most difficult problems

Take your mind off unpleasant thoughts

Stop yourself from being upset by unpleasant thoughts

Keep from feeling sad

Get friends to help you with the things you need

Get emotional support from coworkers

Get emotional support from family outside of work

Mindfulness

Mindfulness Attention Awareness Scale; Brown & Ryan, 2003

Instructions: Below is a collection of statements about your everyday experience. Using the scale below, please indicate how frequently or infrequently you currently have each experience. Please answer according to what really reflects your experience rather than what you think your experience should be. Please treat each item separately from every other item.

Response Options: 5-point scale (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Always)

I could be experiencing some emotion and not be conscious of it until sometime later.

I break or spill things because of carelessness, not paying attention, or thinking of something else.

I find it difficult to stay focused on what's happening in the present.

I tend to walk quickly to get where I am going without paying attention to what I experience along the way.

I tend not to notice feelings of physical tension or discomfort until they really grab my attention.

I forget a person's name almost as soon as I have been told it for the first time.

I rush through activities without being really attentive to them.

I get so focused on the goal I want to achieve that I lose touch with what I am doing right now to get there.

I do jobs or tasks automatically, without being aware of what I am doing.

I drive places on "automatic pilot" and then wonder why I went there.

I find myself preoccupied with the future or the past.

I find myself doing things without paying attention.

I snack without being aware that I am eating.

Stress Management at Work

This next set of questions asks about resources offered through your work to help you manage stress.

Stress Management Resources/Strategies at Work

Instructions: Please respond to the following questions about resources or strategies utilized by your workplace to alleviate stress and/or improve mental health.

Check all that are applicable.

Response Options: Indicate (1) whether each is offered currently (Yes/No), (2) if offered, whether personally used (Yes/No), and (3) if used, how effective on a 5-point scale (1 = Not at all effective, 2 = Slightly effective, 3 = Somewhat effective, 4 = Very effective, 5 = Extremely effective)

Opportunities to exercise during the workday (e.g., on-site equipment or exercise facilities)

Trainings related to physical health/wellbeing

Trainings related to stress management/mental health

Meditation, yoga, or mindfulness training

Employer-provided therapy or counseling (e.g., meetings with an on-site psychologist, counseling through an Employee Assistance Provider [EAP])

Critical Incident Stress Debriefing

Formal mentoring program

Informal mentoring

Peer Support Program

Gatherings with colleagues outside of work time (e.g., parties, barbecues)

Informal gatherings with colleagues during work time (e.g., lunches)

Sharing work and/or personal accomplishments and announcements (e.g., through a newsletter, announcements, website, etc.)

Other (Please Describe) _____

Other (Please Describe) _____

Other (Please Describe) _____

Personal (Non-Work) Stress Management

Instructions: Please respond to the following questions about resources or strategies you use outside of work to alleviate stress and/or improve mental health.

Response Options: Indicate (1) whether each is personally used (Yes/No), (2) if used, how effective on a 5-point scale (1 = Extremely ineffective, 2 = Ineffective, 3 = Neither effective nor ineffective, 4 = Effective, 5 = Extremely effective)

Physical exercise

Meditation, yoga, or mindfulness

Engaging in hobbies

Therapy or counseling

Learning something new/mastering a new skill

Avoiding news or media (e.g., books, movies, TV) that contain death/violence

Seeking support from family

Seeking support from friends

Socializing with work friends outside of work time

Participation in religious or other community groups

Travel/vacation

Volunteering

Eliminating or reducing exposure to media (“electronic detox”)

“Zoning out” or detaching from reality (e.g., by watching TV, surfing the internet, napping)

Drinking alcohol

Other (Please Describe) _____

Other (Please Describe) _____

Other (Please Describe) _____

Input about MDI Align (the MDI stress reduction app; only asked at follow-up)

Open-ended Questions

How helpful did you find MDI to be in managing your work-related stress as an MDI?

To what extent did MDI Align help improve your health and wellness (e.g., make you feel more relaxed, get better sleep, implement better health habits)?

What recommendations do you have for improving the app?

Information about You and Your Office (only asked at baseline)

Instructions

We are collecting the following information to better understand how work-related stress affects MDIs in different types of jobs and situations. It will NOT be used to identify any individuals and will only be reported in the aggregate.

1. How long have you worked in your current job role?

How many cases/investigations do you work on or oversee per week (on average)?

Select the best description of your office. Select only <u>one</u> option.

- ○ A. State medical examiner office
- ○ B. District/regional medical examiner office
- ○ C. County medical examiner office
- ○ D. City medical examiner office
- ○ E. County coroner office
- ○ F. District/regional coroner office
- ○ G. Private autopsy facility serving the medical examiner/coroner community
- ○ H. None of the above

What level of government best describes your office?

- ○ City office
- ○ County office
- ○ District/regional office
- ○ State office

Which of the following best describes the agency your office reports to or is part of?

- ○ Public health agency (e.g., department or division of public health)
- ○ Law enforcement agency (e.g., department or division of public safety)
- ○ Government attorney's office (e.g., district attorney)
- ○ County level government office
- ○ Department or division of forensic science
- ○ My office does not report to another agency
- ○ Other (please specify)

What jurisdiction(s) does your office serve (e.g., State of North Carolina; Orange County, Florida; New York City; First Judicial District)?
Please select the state that your office operates in. (All 50 states plus DC drop down)
What are the responsibilities of your MDI office? Select <u>all</u> that apply.

- ☐ A. Determine the cause and manner of death
- ☐ B. Conduct inquests
- ☐ C. Assist medical examiners in death investigations
- ☐ D. Move the decedent from location of death
- ☐ E. Order toxicology testing
- ☐ F. Execute arrest warrants and serve process
- ☐ G. None of the above

What is your age?

1 Under 18
2 18-24
3 25-34
4 35-44
5 45-54
6 55-64
7 65 or older
8 Prefer not to answer

What is your gender?

1 Male
2 Female
3 Other
4 Prefer not to answer

How would you describe yourself? *Select all that apply.*

1 White
2 Hispanic, Latino, or Spanish origin
3 Black or African American
4 Asian
5 American Indian or Alaska Native
6 Middle Eastern or North African
7 Native Hawaiian or Other Pacific Islander
8 Other race, ethnicity, or origin
Specify: [TEXT BOX 30 CHARACTERS]
9 Prefer not to answer

Marital Status

( ) Married
( ) Divorced or separated
( ) Widowed
( ) Living with significant other
( ) Never married

Number of dependents

( ) 0
( ) 1
( ) 2
( ) 3
( ) 4
( ) 5
( ) 6
( ) 7
( ) 8
( ) 9
( ) 10+

What is the highest level of education you have completed?

1 High school diploma/GED
2 Some college
3 Associate degree (AA, AS, AAS)
4 Bachelor's degree (BA, BS, BFA, BAS)
5 Master's degree (MA, MS, MBA, MPH)
6 Doctoral or Professional Degree (PhD, JD, MD)
7 Prefer not to answer

Appendix C: Daily and Weekly Impact Study Surveys

Daily Log

AFTER WORK, BEFORE BED (In MDI app, prompted by push notifications)

- Work activities
  - Did you work today (in your role as an MDI professional)? (Yes/No)
  - If Yes:
    - What time did you start working?
    - What time did you stop working?
      - Virtual v. in-person, options to enter multiple shifts
    - Which of the following issues or events did you experience while at work today? (Check all that apply.)
      - Working multiple scenes or cases at once
      - Working on a particularly challenging or upsetting case (if selected, show the following; check all that apply)

        Complex Case

        Infant/Child Death

        Drug Overdose Death

        Suicide Investigation

        Homicide Investigation

        Death of Individual You Know

        Death of Someone who Reminds You of Someone You Know

        Death of Someone Similar to Yourself

        High Profile Death

        Multiple Fatalities

        Death in Custody

        Police-Involved Death (e.g., shooting by law enforcement)

        Other_____

      - Working alone
      - Inadequate staffing
      - Lack of resources (e.g., training, equipment, physical workspace, technology)
      - Excessive administrative duties
      - Going to court/giving a deposition
      - Conflict about a case with other agencies (e.g., law enforcement) at the scene or with a professional outside of my organization
      - Lack of respect from other emergency service or medical personnel
      - Having to give a death notification
      - Difficult interactions with decedents' friends or family members
      - Difficulty with supervisor(s)
      - Difficulty with coworkers or contractors
      - Not enough time to spend with friends or family

        - Occupation-related health issues (e.g., back pain, exposure to disease)
        - Fatigue
        - Insufficient breaks (e.g., to relax or for meals)
    - Did you work today at a job other than your role as an MDI professional? (Yes/No)
        - Stress levels
            - How stressful was your workday today?
            - (not at all stressful, slightly stressful, moderately stressful, very stressful, extremely stressful)
            - How stressful was your day today outside of work?
            - (not at all stressful, slightly stressful, moderately stressful, very stressful, extremely stressful)

WITHIN 1 HR OF WAKING (In MDI app, prompted by push notifications)

- Sleep quality:
    - "How would you rate your sleep quality overall?"
      (very good, fairly good, fairly bad, very bad)

Weekly Assessments (In MDI app, prompted by push notifications)

Was this week notably different from a "normal" week for you? (Yes/No)

- If yes:
    - What was different about this week?
        - I was sick
        - I had more family demands than usual (e.g., more childcare or eldercare responsibilities)
        - I worked more than usual
        - I was on vacation
        - Other (please describe) _____
            - What else would you like to tell share about this past week?
    - Which of the following programs or strategies did you use this <u>past week</u>? (Check all that apply)

At Work:

Opportunities to exercise during the workday (e.g., on-site equipment or exercise facilities)

Trainings related to physical health/wellbeing

Trainings related to stress management/mental health

Meditation, yoga, or mindfulness training

Employer-provided therapy or counseling (e.g., meetings with an on-site psychologist, counseling through an Employee Assistance Provider [EAP])

Critical Incident Stress Debriefing

Formal mentoring program

Informal mentoring

Peer Support Program

Gatherings with colleagues outside of work time (e.g., parties, barbecues)

Informal gatherings with colleagues during work time (e.g., lunches, socializing during breaks)

Sharing work and/or personal accomplishments and announcements (e.g., through a newsletter, announcements, website, etc.)

Other (Please Describe) _____

Outside of Work:

Physical exercise

Meditation, yoga, or mindfulness

Engaging in hobbies

Therapy or counseling

Learning something new/mastering a new skill

Avoiding news or media (e.g., books, movies, TV) that contain death/violence

Seeking support from family

Seeking support from friends

Socializing with work friends outside of work time

Participation in religious or other community groups

Travel/vacation

Volunteering

Eliminating or reducing exposure to media (“electronic detox”)

“Zoning out” or detaching from reality (e.g., by watching TV, surfing the internet, napping)

Drinking alcohol

Other (Please Describe) _____

Appendix D: MDI Align Mindfulness and Wellness Content

Title	Description
Video Files	
MDI Intro	Introductory video to the MDI Align app
The Effects of Stress on the Body and Mind	Katherine Pope, Forensic Investigator and Anthropologist, provides an overview of terminology used to describe how the human body reacts to stress.
Find Your Thing	Kelly Keyes, former death investigator of 24 years, shares how it's important to not fall victim to the "don't wannas." She encourages us to find something outside of work that you enjoy and commit to it.
De-stressing the Office Environment	Kathryn Pinneri, Director of Forensic Services in Montgomery County, Texas, shares how her office moves past the "suck it up" narrative many medical examiner and coroner [MEC] offices often face when work-related stress is mentioned. Kathryn shares various coping strategies she's adopted throughout her career and that you can implement as well.
Shift Management	In this video, we are reminded "stress is inevitable" but we can cope. Bryan Hoffman, NJ Department of Health Office of the Chief State Medical Examiner, explores some of the stressors medicolegal professionals face on the job and provides tips on how to combat those stressors.
Strategies for Supportive MDI Leadership	In this video, Kathryn Pinneri, Director of Forensic Services in Montgomery County, Texas, discusses strategies that supervisors can implement to support their employees. Strategies discussed include pet therapy, staff lunches and fellowship time, creating a safe outdoor space to unwind, and having some healthy competitions around the office to support camaraderie, team building, and boost morale.
Nutrition	Bob Hunter, Retired San Bernardino County Sheriff-Coroner, discusses the importance of taking care of your body through proper nutrition and working with your physician to maintain health and combat stress.
Take 22	John Fudenberg, Retired Las Vegas Coroner, discusses how his office supported the mental health of their staff following a mass shooting incident, through a "Take 22" initiative. John acknowledges the stressors medicolegal professionals face on-the-job and the importance of taking time for yourself, even for just 22-minutes a day, to focus on things that make you feel good.
19 Tips to Maintain Health	Sandra Williams, a medicolegal professional with 18 years of experience, provides examples of simple and actionable changes we can implement to help us mitigate stress throughout the day. Using your vacation time to unplug, maintaining a healthy diet and exercise plan, journaling,

Title	Description
	volunteering, and making to-do lists are a few tips Sandra shares.
It Will Get Better	With more than 20 years of experience, Elizabeth Ortiz, medicolegal death investigator for Colorado, shares strategies she's found to be helpful in order to cope with stress. Elizabeth suggests tips to find your community and focus on activities that make you happy.
Journaling	Katherine Pope, Forensic Investigator and Anthropologist, discusses how work-related stressors impacted her daily life as an MDI professional of 15 years. Katharine shares how she uses journaling to manage thoughts and cope with stress.
MDI Outro	Ending video to MDI Align app after completion of intervention
Audio Files	
Title	Description
Soft Bell Sound	Prepare yourself for meditation with this soft bell sound.
Light Bell Sound	Sound of a light bell to center yourself before meditation.
Three Bells	Sound of three light bells to center yourself before meditation.
5-minute Body Scan	Take a restorative break and let go of the stress of the day with this quick 5-minute body scan.
20-minute Body Scan	Cultivate awareness without judgement and feel the whole of your body in this 20-minute body scan.
21-minute Body Scan	Cultivate awareness without judgement and feel the whole of your body in this 21-minute body scan.
18-minute Sleep Body Scan	As you prepare to rest, cultivate awareness without judgement and feel the whole of your body in this 18-minute body scan.
19-minute Sleep Body Scan	As you prepare to rest, cultivate awareness without judgement and feel the whole of your body in this 19-minute body scan.
5-minute Informal Walking	Cultivate an internal sense of calm with this 5-minute mindful walking exercise.
10-minute Formal Walking	Become aware of your mind and body's connection with this 10-minute walking meditation exercise.
6-minute Breathing	Shift your mind state to bring a sense of refreshment and calm to your body with this 6-minute breathing exercise.
Breathing Space	Foster a positive, safe space for your mind in this 3-minute breathing exercise.
6-minute Lovingkindness	Deepen your sense of wholeheartedness with this 6-minute guided meditation.

Title	Description
10-minute Sitting Meditation	Center yourself and deepen your understanding of your mind state in this 10-minute sitting meditation.
15-minute Lovingkindness	Take a moment in private to cultivate love, kindness, and grace within yourself in this 15-minute guided mindfulness exercise.
20-minute Sitting Meditation	Center yourself and deepen your understanding of your mind state in this 20-minute sitting meditation.
Health Tips	
Categories of health tips	Example item
Self-care	Today, aim to drink at least 64 fluid ounces of water.
Stress	Think about your stress triggers today. - Who was involved? - Where were you? - How did you feel? What can you do today to try to tackle those triggers? How can you manage your feelings and physiological stress reaction?
Sleep	Remove electronic devices, such as TVs, computers, and smart phones, from your bedroom to improve sleep.
General Health Content	
Categories of sleep hygiene content	Example text
Factors impacting sleep	How we treat our bodies can affect our ability to sleep. Limit or eliminate caffeine, nicotine, alcohol, energy drink and energy supplements to improve sleep.
Setting the stage for quality sleep	Your brain is a creature of habit, so it is important to establish a bedtime routine that you follow each time you lay down to rest. Some relaxing things you can do to create this routine include taking a warm bath or shower, practicing mindful breathing, listening to relaxing music or doing some light reading, and mediation or prayer.
Steps to improve sleep	Cover all clocks in your room or face the clock away from your face. Watching the clock is a wakeful activity that will impede your ability to fall asleep.
Developing a plan to sleep smarter	Decide on a set rising time dependent on your shift schedule and put that into practice. Ensure that this time can be flexible based on your shift for that day.

Title	Description
Dealing with nightmares and night terrors	When you experience a nightmare, use the following steps to mindfully ground yourself: Tell yourself “I am having a nightmare. This is not real; it is not happening except in my mind.” Sit up in bed and put your feet on the floor. Focus on your surroundings by naming objects in your room. Use soothing self-talk like “I am in my bedroom. The month is _____. The year is 20XX. I am safe.” Engage your senses like taste, smell, touch, and sound to ground yourself in the present.
Categories of mindfulness content	Example text
How breathing reduces stress	We can use breath to direct our awareness to different aspects of our lives—for example, to relax tense muscles or focus on a situation that requires attention. Breath can also be used to help deal with pain, anger, relationships, or the stress of daily life. View Practice Mindful Breathing to learn the technique.
Practicing mindful breathing	As best you can, follow with your awareness all of the changing physical sensations as the breath enters your body on the in-breath and leaves your body on the out-breath, perhaps noting the slight pause between each in-breath and out-breath.
Journaling content	Expressive journaling has been shown to reduce stress, improve immune function, improve memory, boost moods, and strengthen emotional functions. If you like, try journaling a few minutes each day about your thoughts, feelings, and behaviors from that day. What do you want to accomplish the next day? You can use a pen and paper, or choose from the multiple of journaling apps that specialize in this process. Some of the best include: Day One, Momento, Penzu, and Diaro.