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Hawai‘i Journal of Health & Social Welfare

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Alcohol-Induced & Drug-Induced Deaths in Hawai‘i During the COVID-19 Pandemic

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Abstract

During the COVID-19 pandemic, there was a marked increase in alcohol and drug-induced deaths. In the US, there was a rapid increase in the rate of alcohol- and drug-induced deaths within the first year of the COVID-19 pandemic compared to pre-pandemic years. This study examines mortality data within Hawai‘i to assess both alcohol and drug-induced mortality during the pandemic compared to the nation overall. Data from the Centers for Disease Control and Prevention Underlying Cause of Death database were used to compare numbers and rates of alcohol-induced, drug-induced, and all-cause deaths among individuals aged 15 years or older between 2018 and 2021. The percentage of alcohol-induced and drug-induced deaths in the US and Hawai‘i increased annually in 2018, 2019, 2020, and 2021. Unlike the US, in Hawai‘i between 2020 and 2021 the age-adjusted rate of drug-induced deaths per 100 000 people decreased from 20.6 to 18.6. Overall, this study found that alcohol-related deaths in Hawai‘i increased similarly to those in the US during the COVID-19 pandemic.

Keywords

alcohol-related death, drug-related death, COVID-19

Abbreviations

CDC = Centers for Disease Control and Prevention
COVID-19 = Coronavirus Disease of 2019
ICD-10 = International Classification of Diseases version 10

Introduction

Worldwide, preliminary data around the impact of Coronavirus Disease of 2019 (COVID-19) have shown an acceleration in alcohol and drug-induced deaths.[1] In the US, alcohol-induced deaths in the first year of the COVID-19 pandemic increased rapidly compared to pre-pandemic years.[2] This increase was comparatively greater than the rate increase in all-cause mortality in 2019-2021.[2] Similarly, drug-induced deaths increased during the COVID-19 pandemic, with over 95 000 persons in the US dying from drug-induced overdose in 2020.[3] A 2020 study by the Addiction Policy Forum found that 20% of study participants with substance use disorder reported an increase in substance abuse during the COVID-19 pandemic.[4] There is limited data on the COVID-19 pandemic condition's effect on rising drug use, illicit drug supply changes, and treatment access.[5] In 2004, the Alcohol and Drug Abuse Division of State of Hawai‘i Department of Health estimated that 85 468 people (9.7%) of the Hawai‘i population needed treatment for alcohol and/or other drug dependence and abuse, 81 377 (9.3%) needed treatment for alcohol dependence and abuse alone, and 15 186 (1.7%) needed treatment for drug dependence and abuse alone.[6] This needs assessment also found that Hawai‘i's drug choices favor substances that can be "easily grown or easily imported with minimal secondary processing" and that there is an aversion to intravenous drug use and an affinity for drugs that can be smoked.[6] These factors and the geographically closed environment of an island state make the Hawaiian Islands a unique opportunity for comparison. This study examines mortality data within Hawai‘i to assess both alcohol and drug-related mortality during the pandemic compared to the nation overall.

Methods

Data from the Centers for Disease Control and Prevention (CDC) database for "Underlying Causes of Death, 1999–2021" was summarized and reviewed for alcohol-induced, drug-induced, and all-cause deaths between 2018 and 2021.[3] All data queries included the following criteria: 15–100 years and older, year of death (between 2018 and 2021), and state where the death occurred. All state-level data with less than ten deaths in any category is suppressed by the CDC for patient privacy.[3] Drug/alcohol-induced causes, as grouped by the CDC, were utilized to determine the cause of death.[3] The drug/alcohol-induced causes grouping does not entirely correlate to International Classification of Diseases (ICD-10) codes but uses "'recodes' defined to support analysis by the selected causes of death groups."[3] Some ICD-10 codes included in this grouping include unintentional (ICD-10 X40-44), suicide (ICD-10 X60-64), homicide (ICD-10 X85), and undetermined drug and alcohol overdoses (Y10-14).[3] Age-adjusted rates were calculated by the CDC using "weighted averages of the age-specific death rates, where the weights represent a fixed population by age."[3] Collected data were summarized and reviewed at the county and state of Hawai‘i level using Microsoft Excel, version 16.71 (Microsoft Corporation, Redmond, WA). State of Hawai‘i data was included within the total US data for analysis in this manuscript.

Results

Between 2018 and 2021, there were a total of 47 348 deaths from all causes in Hawai‘i and 12 422 217 deaths from all causes

in the US (**Table 1**). There was a similar positive increase per year in the total number of alcohol-induced deaths and drug-induced deaths in the US and Hawai‘i between 2018 and 2021. Throughout this period, Hawai‘i had a higher percentage of drug-induced deaths per year than the total US except in 2021: 14.8% versus 13.4% in 2018, 16.8% versus 14.0% in 2019, 19.3% versus 18.0% in 2020, and 18.7% versus 20.7% in 2021, respectively. The age-adjusted rate of alcohol-induced deaths per 100 000 people increased in the US and Hawai‘i annually between 2018 and 2021: from 9.9 (95% CI 9.8-10.1) to 14.4 (95% CI 14.3-14.5) in the US and from 5.7 (95% CI 4.5-7.0) to 8.2 (95% CI 6.8-9.6) in Hawai‘i. (**Table 2**). The age-adjusted rate of drug-induced deaths per 100 000 people in the US increased 54% during this same period from 21.8 (95% CI 21.7-21.9) in 2018 to 33.6 (33.4-33.8) in 2021. The age-adjusted death rate for drug-induced deaths in Hawa‘i increased 30% from 2018 (15.8 [95% CI 13.7-17.9] in 2018) to 2021 (20.6 [95%CI 18.2-23.0]). Between 2020 and 2021, the age-adjusted rate of drug-induced deaths per 100 000 people in Hawai‘i was 20.6 (95% CI 18.2-23.0) and 18.6 (95% CI 16.4 -20.9), respectively.

Table 1. Total All-Cause, Alcohol-Induced, and Drug-Induced Deaths per Year in the US and Hawai‘i, 2018 - 2021[3]

	2018	Percent of Total Deaths[a] (%)	2019	Percent of Total Deaths[a] (%)	2020	Percent of Total Deaths[a] (%)	2021	Percent of Total Deaths[a] (%)
Total US								
All-Cause Deaths	2 808 314	--	2 824 597	--	3 354 879	--	3 434 427	--
Alcohol-Induced Deaths	37 329	7	39 043	7.3	49 061	9.2	54 258	10.2
Drug-Induced Deaths	71 147	13.4	74 511	14	96 096	18	111 219	20.7
Hawai‘i								
All-Cause Deaths	11 268	--	11 430	--	11 927	--	12 723	--
Alcohol-Induced Deaths	89	5.7	96	6.1	131	8.4	134	8.6
Drug-Induced Deaths	232	14.8	263	16.8	302	19.3	293	18.7

[a] The percent of total deaths is calculated by dividing the total number of alcohol-induced or drug-induced deaths in a given year by the total all-cause deaths and multiplying by 100.

Table 2. The Age-Adjusted Death Rate per 100 000 People per Year for Alcohol-Induced and Drug-Induced Causes of Death in the US and Hawai‘i, 2018 – 2021

	Age-Adjusted Death Rate (95% CI)[a,b]			
	2018	2019	2020	2021
Total US				
Alcohol-Induced Cause of Death	9.9 (9.8-10.1)	10.4 (10.3-10.5)	13.1 (13.0-13.3)	14.4 (14.3-14.5)
Drug-Induced Cause of Death	21.8 (21.7-21.9)	22.8 (22.6-22.9)	29.5 (29.3-29.7)	33.6 (33.4-33.8)
Hawai‘i				
Alcohol-Induced Cause of Death	5.7 (4.5-7.0)	5.9 (4.7-7.3)	8.0 (6.6-9.5)	8.2 (6.8-9.6)
Drug-Induced Cause of Death	15.8 (13.7-17.9)	17.5 (15.4-19.7)	20.6 (18.2-23.0)	18.6 (16.4-20.9)

[a] Rate per 100 000 population. All death rates are age-adjusted to the 2000 US Standard Population.
[b] A 95% CI was calculated as the rate +/- 1.96 times the standard error. A standard error was calculated following the technical guidance of the National Vital Statistics Reports to take into account random variation.[3]

Discussion

Prior to the COVID-19 pandemic, 2018 – 2019, the percent increase in the percentage of alcohol-induced deaths in the US was similar to the percent increase in the percentage of alcohol-induced deaths in Hawai‘i, 4.3% and 4.5%, respectively. The percent increase in the percentage of alcohol-induced deaths continued to rise annually during the COVID-19 pandemic, with the US and Hawai‘i’s percentage of total alcohol-induced deaths in 2021 being 39.7% and 41% percent higher in 2021 than in 2019 before the COVID-19 pandemic. The percent increase in the age-adjusted rate of alcohol-induced deaths per 100 000 people in the US and Hawai‘i also increased during the COVID-19 pandemic by 38.5% and 39%, respectively. Previous research has suggested increasing alcohol consumption during the COVID-19 pandemic was a result of socioeconomic changes, disruption to mental health and substance use treatment services, and physical isolation.[7] A 2020 study by the Addiction Policy Forum found that 34% of participants with substance use disorder experienced disruptions in accessing treatment or recovery services, with 14% being unable to receive needed substance use disorder treatment services during the pandemic.[4] The increased alcohol consumption and decreased access to substance use disorder treatment and recovery services were exacerbated by the first year of the COVID-19 pandemic lockdown likely contributed to the similar rate of increased alcohol-related deaths in the US and Hawai‘i.

The percentage increase in the percentage of drug-induced deaths also increased in the US and Hawai‘i before the COVID-19 pandemic, 2018-2019, 4.5% and 13.5%, respectively. At the national level, the percent increase in the percentage of drug-induced deaths increased substantially in 2020, the first year of the COVID-19 pandemic, by 28.6%, while Hawai‘i’s percent increase in the drug-induced percentage of total deaths only increased by 14.9%, similar to pre-pandemic levels. Hawai‘i actually had a 3.1% decrease in the total percent of drug-induced deaths in 2021, while the US saw a 15% increase in the total percent of drug-induced deaths during the same year of the COVID-19 pandemic. This negative trend is also reflected in the 9.7% decrease in the age-adjusted rate of drug-induced deaths in Hawai‘i per 100 000 people in 2021. The reduction in drug-related deaths between 2020 and 2021 could be attributed to reductions in supply and retail related to reduced drug trafficking and strict lockdown measures preventing social interaction for drug sales. Drug sales in Hawai‘i, in particular, may have been affected by the reduction in air transport.[8] In 2021, the Hawai‘i High Intensity Drug Trafficking Area also found that the estimated cost of heroin was $120 - $160 per gram, while methamphetamine was $40 per gram.[9] After alcohol, methamphetamine remains Hawai‘i’s most prevalent drug of misuse among adults,[10] as evidenced by an 87.5% increase in adults admitted to treatment for methamphetamine abuse in 2017.[11] In 2021, the rate of drug overdose-related deaths nationally was highest for synthetic opiates (eg, fentanyl), followed by psychostimulants (eg, methamphetamine). A similar trend of increased methamphetamine use over heroin during the COVID-19 pandemic has also been found in Hawai‘i by practicing addiction medicine physicians.[12] More research is needed to determine how the changing pattern of substance use nationally and in Hawai‘i is resulting in fewer deaths despite the increased use of psychostimulants like methamphetamine during the COVID-19 pandemic.[13]

Limitations

Due to privacy concerns at the state of Hawai‘i level, numerous alcohol-induced and drug-induced causes of death per year were suppressed by the CDC, limiting the ability to differentiate between the manner of alcohol and drug-induced death, such as unintentional versus suicide or homicide. Due to the above limitation, data analysis at the monthly level was also unable to be completed at the state of Hawai‘i level, which would have provided greater insight into data trends after the first US state-issued stay-at-home-order for the COVID-19 pandemic on March 19, 2020.[2]

Conclusion

These findings provide valuable insights into the impact of the COVID-19 pandemic on substance-related mortality rates in Hawai‘i. The decrease in drug-induced deaths in Hawai‘i during 2021, likely related to limited air travel during the COVID-19 lockdown, provides insight into the ability to help mitigate drug-induced deaths by more tightly monitoring airline passengers and cargo. Future investigations may provide insight into the long-term secondary health consequences of the COVID-19 pandemic, especially regarding alcohol and drug-related substance use. These findings may guide policy changes and targeted interventions to prevent and reduce these substance-related harms.

Conflict of Interest

We certify that we have no financial affiliation/interest (eg, employment, stock holdings, consultantships, honoraria) in this manuscript’s subject matter, materials, or products. We have no conflict of interest to report nor any interests represented with any products discussed or implied.

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Building Resilience in Medical Students: "Strengthening You to Strengthen Them"

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Abstract

Medical students, like many health professional students, are at risk for burnout and other negative well-being outcomes. Research suggests that building resilience may help to mitigate these risks. A multi-disciplinary team developed, delivered, and evaluated a training on building resilience for medical students entitled, "Resilience for Health Providers – Strengthening You to Strengthen Them." The training program provided parallel learning intended to teach medical students how to apply protective factors to both themselves and their patients. The research team proposed that training medical students to understand mechanisms that support resilience such as motivation and self-efficacy may increase the development of resilience as part of their medical training. Through parallel learning, students can also learn how to apply these mechanisms to their patients. The evaluation of the training's effectiveness consisted of pre- and post-tests. Medical students' resilience was measured using the Connor-Davidson Resilience Scale (CD-RISC-10), a tested and validated scale. Findings indicated that post-test scores increased in each domain from pre-test. Participants reported enhanced skill building for both their own resilience and that of patients after the training. Results from the CD-RISC-10 scale showed that the medical students rated slightly lower than the mean identified by the CD-RISC-10 creators. The results from this initial study to strengthen health professionals' self-reported resilience showed that the training improved medical students' self-reported resilience and their confidence in assisting houseless participants to improve their understanding of building their own self-resilience.

Keywords

Resilience, Medical Students, Resilience Training, Interdisciplinary

Abbreviations

CD-RISC-10 = Connor-Davidson Resilience Scale
EHPs = emerging health professionals

Introduction

A multi-disciplinary team funded by the Clinical Scholars Program, a national leadership program of the Robert Wood Johnson Foundation (RWJF), brought together areas of expertise to empower students in health care professional programs, referred to as emerging health professionals (EHPs). The team consisted of 2 medical doctors (endocrinologist and internist), a pharmacist, a psychologist, and a social worker. The team sought to strengthen students' abilities in areas such as resilience, leadership capacities, and knowledge of managing chronic illnesses such as diabetes and pre-diabetes. This was done through training, mentoring, and modeling. Due to COVID-19, the medical students were unable to work in-person with patients for a period of time, and this placed additional stress on them. At the same time, the stress the medical students experienced created an opportunity to help empower them through resiliency education. Thus, this project aimed to focus on empowering EHPs, specifically medical students, who attended the training discussed in this paper, to build both resilience in themselves while encouraging resilience in the populations with whom they serve through parallel learning. Parallel learning is a technique that teaches something in the classroom setting so that it can be modeled in the practice field.

This paper's focus is on the results of a resilience training program provided to medical students, "Resilience for Health Providers – Strengthening You to Strengthen Them." Building resilience was chosen as a mechanism to help the medical students both through the pandemic, as well as their schooling. Using parallel learning techniques, the training also aimed to help students build resilience within their patients.

Resilience

Much of the published literature defines resilience based on the context of each individual paper.[1-3] In an integrative review of the resilience literature in health professions, authors indicated that there is no one definition of resilience in recent literature.[2] However, key themes within resilience definitions can be identified, such as resilience being a dynamic process, involving adaptation and adjustment, and the ability to "bounce back."[2] In 2019, Vella and Pai identified common aspects in definitions of resilience as bouncing back and overcoming an adversity; additionally, they emphasized the influence of resilience leading to positive outcomes despite an adverse situation.[3]

Research suggests that resilience can be learned.[4,5] A critical review of the resilience literature concluded that resilience can be both learned and improved upon.[5] Furthermore, it has

recommended discussion of resiliency for all undergraduate health professional students.[5] Identity building, building coping skills and strengths, and being given the opportunity to reflect and learn from others has been identified as integral to teaching resiliency.[5]

A scoping review of resilience in health professional education found support for the need of resilience enhancement among health professional students, and the authors of that review highlighted a study which indicated that resilience is essential for admission into medical school.[6] They also identified 22 resilience factors, which included flexibility, motivation, self-efficacy, spirituality, and social support.[6] Some of the same factors are reflected in the resilience training program described in this study.

In a review of the concept of grit and resilience in the health professions, Stoffel and Cain identified methods for teaching resilience. These methods included problem-based learning, self-care activities, teaching adaptive responses, identifying maladaptive coping mechanisms, and mentorship.[7] Additionally, individual protective factors were identified as crucial and a major influence on resilience development. These protective factors included coping skills, social support, positive role modeling, and mentorship.[7]

Research specifically with medical students utilizing the Connor Davidson Resilience Scale (CD-RISC-10) has provided additional information of various groups of medical students. The CD-RISC-10 is measured on a scale of 0-40; a higher score indicates higher levels of resilience. In a study in Mexico, the mean score on the CD-RISC-10 of medical students was 37.48 while the score for their psychology students was 35.15.[8] In a study using the CD-RISC-10 of Canadian medical students, researchers found that female medical students had a mean score of 28.84 and male medical students, a mean score of 31.25.[9] A study using the CD-RISC-10 examined medical students at the University of Saskatchewan, and found that resilience was a partial mediator of the relationship between attachment and the level of perceived stress.[10] Specifically, resilience altered the way in which stress was perceived, thus altering the response to it.[10] Examining psychological distress among female medical students at Universities in Malang, using the CD-RISC-10, authors found that "…The higher the level of medical students' resilience, the lowest the level of students' psychological distress and vice versa, the lowest the level of medical students' resilience, the highest the level of students' psychological distress".[11]

Research-Based Protective Factors

For the purpose of the training provided for this project, the designers of the training selected the following protective factors to focus on, based on the literature and on practice experience. These protective factors are similar to the lists provided above; however, they differ slightly due to the experience of the training designers.

Motivation. Crane and Havercamp "found that the DSP (direct service provider) who is resilient to stress and burnout is motivated by family, social relationships, and the desire to contribute to the well-being of their community (citizenship)".[12] DSPs are similar to the EHPs discussed earlier. In examining challenges faced by pharmacists, specifically during the COVID-19 pandemic, Whitfield and Wilby highlight identifying a connection to one's life and work through motivation and resilience. Additionally, the authors speak to the importance of having purpose to provide for motivation, self-determination, and the ability to bounce back.[13]

Self-Efficacy. In a 2018 study of nurses, Wang et al found that self-efficacy had a direct and positive significant effect on resilience.[14] Studying university students and academic resilience, 1 study found that academic self-efficacy was a significant predictor of resilience.[15]

Social Support. For social work students, family and friend social support have been found to be positively associated with resilience.[16] In a study of health care professionals during the COVID-19 pandemic, Brown et al found that participants utilized social support from friends and families to promote resilience.

Other Factors. Having hope and a resilient mindset were identified as important to promoting resilience in a qualitative study.[17] In a study of child welfare workers, hope was directly associated with lower levels of burnout.[18] Initiative-taking was identified as important in resilience of health professionals among focus groups members in the study by Matheson et al as were flexibility and adaptability.[19] Creative thinking was discussed in a study of Lithuanian public health professionals in looking at how creative thinking aided in resilience during the pandemic.[20] Finally, communicating effectively to enhance resilience was highlighted in a study of focus groups with nurses caring for older people.[21]

Medical Students

Existing literature supports resilience as a critical aspect influencing medical student success. For example, Cheung et al emphasize that the mental health of this group declines during medical school because of the lack of sleep and high levels of stress and responsibility, indicating that their well-being and resilience may suffer, and they may face higher risks of burnout or failure. Williams et al found that poor mental health is a common problem for medical students. Under these conditions, activities aimed at enhancing resilience are vital for achieving better outcomes. It was also noted by William et al that it helps to be flexible and adaptive to numerous challenges, to build resilience.[22]

Research by Bird et al[23] and Cheung et al[1] suggests that curriculum programs can improve resilience. This study sought to advance these findings with an innovative resilience curriculum. The resilience program developed for this study was based on research, the direct practice experience of 2 of the authors, and the needs of the student population.

Resilience Training

The training was created by members of the research team. The training incorporated a parallel learning model that helped the students identify and discuss resiliency factors as they apply to the life of a student in a health profession, and then applied the same concepts to case examples of patients, specifically those struggling with houselessness. Parallel processes and learning involve content taught in the classroom that is similar to the skills needed to achieve learning objectives in direct practice.[24] To achieve this parallel learning, the training utilized lecture, self-reflection, examination and application to case examples, and opportunities for question and answer.

The medical students were led through training in 6 research-based protective factors to build their resilience and learn to help those they serve build resilience. These protective factors were: motivation; self-efficacy; appropriate utilization of social support; hope and resilient mindset; initiative-taking, taking charge, and communicating needs; and flexibility and creativity in response to challenges. The trainers then provided examples and descriptions for each protective factor. Students were then led through exercises to help them first implement the protective factor in their own lives, and then in the lives of the population with whom they work.

For example, when discussing the protective factor of motivation, students were asked to think about the reasons they selected their profession, or their "why." When providing the training, the floor was opened to allow students to share their why. Trainers then spoke to why this motivation is important to resilience, such as, helping one to persist when tired, making a tedious task more doable, or reducing the number of choices that must be made daily. Turning the tables, participants were guided through a reflection on why motivation may increase the resilience of houseless individuals in the case study.

Methods

In 2020, a feasibility study was conducted to examine the effectiveness of this resilience training with a variety of EHPs, including medical, social worker, pharmacy, and psychology students. The training was presented virtually due to the COVID-19 pandemic restrictions on in-person learning activities. Students participated in 1 training. The feasibility study found that scores improved from pre-test to post-test, and the open-ended comments were positive about the impacts of the training. Specifically, results of the feasibility study suggested that participants were more able to cope with environmental challenges, participants built up their resilience to stress factors, and participants had improved mental health overall. Adjustments were made for the final version of the training that mainly involved improving the training for an asynchronous virtual environment that allowed for a wider audience. The final training was 60 minutes long and included all of the concepts identified previously. In-person, the participant took the training in 1 sitting. Online, participants could take breaks during the training as needed.

Following the feasibility study, a final version of the training was developed, and presented to the current participants in fall of 2021. Participants were identified by the medical school and were asked to participate in the training; the research team did not have to engage in recruitment. All training participants were medical students. The medical students completed a pre-test survey and answered demographic questions before the training started. The pre-test included 6 questions, with answers based on 5-point Likert scale from "not true at all" to "definitely and completely." Participants were asked to select the answer that best described them, and the questions assessed resilience, understanding of factors related to resilience, ability to teach patients about resilience, comfort level of working with people who are houseless, and competency in helping people who are houseless improve their health. (See **Table 1** for the list of questions). The participants also responded to the full Connor-Davidson resilience scale, a tested and validated scale (CD-RISC-10).[25] A QR code and link to the survey were provided to participants using Qualtrics survey software (QualtricsXM, Seattle, WA). After taking the pre-test, the medical students received the hour-long online synchronous version of the resilience training presented by 2 of the authors. At the end of the training, participants then took a post-test with the same 6 questions in the pre-test and the CD-RISC-10 to measure the efficacy of the training. Participants were given a unique survey code so that their pre and post-tests could be matched.

The CD-RISC-10 measures different aspects of resilience, including flexibility, self-efficacy, the ability to regulate emotion, and cognitive focus/maintaining attention under stress. (See **Table 2** for the list of questions). Overall, the scale is described as a measure of hardiness.[25] Participants provided responses to the questions based on the prompt: "Please indicate how much you agree with the following statements as they apply to you over the past month. If a particular situation has not occurred recently, answer according to how you think you would have felt." The scale measures 10 questions on a 5-point scale, ranging from 0 (not true at all) to 4 (true nearly all the time). The total score is obtained by adding the 10 items together. Scores range from 0 and 40 with higher scores indicating higher levels of resilience.[25] Population scores for the CD-RISC-10 are reported as mean scores between 31.8 and 32.1.[25] The psychometric properties of the scale have been found to apply to a variety of populations, samples, and contexts, and it has been tested

across diverse groups such as university students, health care workers, social workers, and medical students.[25]

Qualtrics survey software normality and equality of variance tests revealed the data was not normally distributed, hence the median was used as the central tendency instead of the mean.[26] In this case, the Wilcoxon Sign-Rank test, which is the non-parametric counterpart of the Paired-Sample *t* test was utilized using R software (R Foundation for Statistical Computing, Vienna, Austria).[27] As this was an evaluation of an educational program, the study was determined to be "not human subjects research" per the institution's Institutional Review Board (IRB) (IRB reference number 2019-00670).

Results

A total of 73 medical students enrolled in the third year of a 4-year medical school program participated in the training. Although this training has been provided to other EHPs, the training session evaluated in this paper was provided only to medical students. In the race/ethnicity question, participants could select multiple responses, thus the percentages do not add up to the number of participants. The majority of participants identified as Asian (66%, n = 64), about 23% (n = 22) identified as Caucasian, and 15% (n = 11) identified as Native Hawaiian or Pacific Islander. About 55% (n = 40) of the participants identified as female. Participants were also asked if they have children to whom they have caregiving responsibilities, and 7 (10%) indicated they did.

Almost all participants (72 of 73) completed the pre-test and 58 completed the post-test. The mean scores and standard deviations from the pre and post-tests are displayed in **Table 1.** Participants' scores on the CD-RISC-10, which was only given at pre-test, ranged from 15 to 40, with the average score being 30 (SD = 5), as displayed in **Table 2**. The reliability measurement for the CD-RISC-10 was high, as indicated by Cronbach's alpha ($\alpha = 0.90$).

Table 3 reveals the comparison between the median response of the 53 participants whose pre-test and post-test scores could be matched. The missing participants (n = 19) did not provide the information requested to match their scores. Statistically significant improvement was seen between pre- and post-test scores for participants' understanding of the importance of self-efficacy in resilience (Question 2, $P = .02$). Significant differences were also found in teaching patients to be more resilient (Question 4, $P < .001$) and in feeling competent in using strategies that help people who are houseless live healthy lives (Question 6, $P < .001$). No significant difference was found between pre- and post-training for Questions 1 ($P = .06$), 3 ($P = .40$), or 5 ($P = .06$), a question asking if participants felt that regardless of what happened, they could make it through rough times.

Although overall participant pre-tests and post-tests have the same median scores, the *P*-value of <.001 suggests that the change in the overall distribution of scores from pre-test to post-test is statistically significant. This means that while the median score remained the same (at 4), there were likely significant

Table 1. Resilience Training Pre- and Post-Test Survey Mean Scores Among Third Year Medical Students from Fall 2021

Question[a]	Pre-test Mean (SD) (N = 72)	Post-Test Mean (SD) (N = 58)
1. Regardless of what happens to me, I believe I can make it through.	4.28 (.77)	4.43 (.57)
2. I understand the importance of self-efficacy in resilience.	4.39 (.66)	4.66 (.48)
3. I understand how motivation helps me to keep trying when things are hard.	4.56 (.50)	4.62 (.49)
4. I can teach my patients skills to be more resilient	3.39 (.88)	4.00 (.68)
5. I feel comfortable working with people who are homeless.	3.76 (.74)	4.05 (.63)
6. I am competent in using strategies that help people who are homeless live healthy lives.	2.96 (.93)	3.78 (.77)

[a] Responses based on a 5-point Likert scale with 1 ="not true at all" to 5 ="definitely and completely."

Table 2. Connor-Davidson Resilience Scale Mean Scores Among Third Year Medical Students from Fall 2021

Question Prompt: Please indicate how much you agree with the following statements as the apply to you over the past month. If a particular situation has not occurred recently, answer according to how you think you would have felt.	N	M(SD)
I am able to adapt when changes occur.	73	4.10(.61)
I can deal with whatever comes my way.	73	4.01(.63)
I try to see the humorous side of things when I am faced with problems.	73	4.18(.65)
Having to cope with stress can make you stronger	73	4.27(.69)
I tend to bounce back after illness, injury, or other hardships.	73	4.15(.72)
I believe I can achieve my goals, even if there are obstacles.	73	4.25(.62)
Under pressure, I stay focused and thing clearly.	72	3.88(.71)
I am not easily discouraged by failure. I think of myself as a strong person when dealing with life's challenges and difficulties.	72	3.56(.87)

Table 3. Comparison of Pre and Post-test Scores for Medical Students Receiving Resiliency Training (N = 72)			
Variable	**Median Pre-test**	**Median Post-test**	**P-Value**
1. Regardless of what happens to me, I believe I can make it through.	4	4	.059
2. I understand the importance of self-efficacy in resilience.	4	5	.015
3. I understand how motivation helps me to keep trying when things are hard.	5	5	.40
4. I can teach my patients skills to be more resilient	3	4	< 001
5. I feel comfortable working with people who are homeless.	4	4	.060
6. I am competent in using strategies that help people who are homeless live healthy lives.	3	4	<.001

shifts in other aspects of the score distributions. For example, there may have been a change in the variability or the specific distribution of individual responses, even if the median itself did not change there was a significant increase in the participants' scores after the training.

Discussion

The results of the resilience training were similar to what was found with the feasibility study. The scores increased in each area, from personal resilience to building resilience in working with the patients after completing the resilience training. The Paired Samples Wilcoxon test showed that after the training, participants better understood the importance of self-efficacy in resilience. In addition, participants believed they could teach their patients skills to be more resilient. The participants indicated they were more competent in using strategies that help people live healthy lives, and that they are well-equipped with the knowledge, skills, and tools to work with houseless individuals. They also felt they were more able to develop and implement effective strategies, and offer support that can lead to healthier and more stable lives.

Interventions or trainings such as this one are needed to help build resilience in medical students. Resilience helps build coping skills to deal with stress[28] and is needed for a successful career.[1] Hayat et al support this idea, saying that higher academic resilience leads to increased self-efficacy and enhanced anxiety management.[29]

This training was also timely. The training was implemented during the COVID-19 pandemic, and therefore it was even more encouraging to see that the training could improve perceived resilience in medical students. It was encouraging to see that medical students had an improved knowledge of self-efficacy and motivation, and that they felt stronger about being able to make it through. After the training was provided to medical students, the trainings were made available to other EHPs, beyond just medical students, in an asynchronous manner to allow for sustainability and the ability for all EHPs to participate in future implementations. The researchers continue to collect pre- and post-test data on the asynchronous trainings and continue to analyze the emerging data.

The CD-RISC-10 allowed for further insight into the resilience of the participants. The average score of the medical students was 30 which was slightly lower than the population findings by Davidson (2021). This indicates that focus on building resilience in this group of students is timely and needed. The CD-RISC-10 score in this study was slightly higher than reported by Houpy et al, who that found that medical students averaged about 28 on the CD-RISC-10 after stressful clinical events.[30] Future studies should include a follow up CD-RISC-10 after the students complete different stages of their schooling and at graduation.

Limitations

There are limitations to this study. This was a small convenience sample; thus, generalization of the findings is limited. There are also concerns for social desirability bias, in that these are students participating in a mandated training and may respond based on how they think they should answer. It cannot be ascertained if the current resilience scores are lower than the other scores reported in the literature due to this sample, due to the COVID-19 pandemic, or due to something else entirely. A post CD-RISC-10 was not completed by participants to determine longevity of the training in improving resilience. Finally, this study was limited to a single, community-based medical school. The study measured whether the students felt more comfortable teaching the protective factors to their patients, which was a self-reported measure based on students' own thoughts of what they would do in the future. Thus, these findings may not be generalizable to other EHPs or other academic settings.

Summary

This training was a novel approach to building resilience in medical students through a parallel learning model. The aims of the training were to help the students learn how to build their own protective factors and teach them how to build those factors in their patients. The study found that the training increased self-assessed skills in building resilience among both the students and the patients with whom they work. The training team continues to provide asynchronous resilience training using this established curriculum with the goal of improving EHPs' own resilience, as well as the resilience of their patients.

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Conflict of Interest

None of the authors identify a conflict of interest.

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Medical School Hotline

Addressing Physician Shortage in Hawai‘i - Kaua‘i Medical Training Opportunities

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In 1993, the Medical School Hotline was founded by Satoru Izutsu PhD (former vice-dean UH JABSOM), it is a monthly column from the University of Hawai‘i John A. Burns School of Medicine and is edited by Kathleen Kihmm Connolly PhD; HJH&SW Contributing Editor.

Abbreviations

HHSC = Hawai‘i Health Systems Corporation
HPH = Hawai‘i Pacific Health
JABSOM = John A. Burns School of Medicine
KMTT = Kaua‘i Medical Training Track

A recent report published by the Association of American Medical Colleges (AAMC) projects a significant physician shortage in the US, with estimates ranging from 13 500 to 86 000 physicians by 2036. This estimate accounts for increases in graduate medical education funding and positions, and is based on physician supply determinates, population demographics (growth and aging), supply of other health care professionals (eg, advanced practice registered nurses and physician associates), and other trends in health care such as a focus on population health.[1] For the state of Hawai‘i, according to the Hawai‘i Physician Workforce Report 2023 (Hawai‘i/Pacific Basin Area Health Education Center), currently there is a 21% physician shortage statewide.[2] Shortage is calculated by dividing the availability of physicians over demand. The shortage on neighbor islands is even greater at 30% to 43% as compared to O‘ahu.[2] Based on a rating scale comparing state shortage ratio to the national mean (C grade), the state of Hawai‘i was awarded a D grade (± 1 SD) for projected physician shortage in 2030.[3]

For those living in rural and medically underserved areas, the growing physician shortage poses a greater threat as these populations are already experiencing higher incidences of disease with poorer outcomes.[4,5] Health conditions such as heart disease, cancer, stroke, diabetes, and unintentional death are disproportionately higher in rural communities where access to health care is already difficult due to geographic, economic, social and physician workforce factors.[4,5] Specialty care in rural areas is often sparse to non-existent, and primary care physicians often have to treat a wide variety of patients with limited resources.[5]

Kaua‘i County, which makes up the entire island of Kaua‘i, is the second most rural county in the state of Hawai‘i. Across the state, 13.9% of the population lives in rural areas. Kaua‘i County is federally designated as rural.[6] According to a state report in 2020, 42% of the county’s population live in rural areas, which on Kaua‘i accounts for 96.2% of the island’s total land area.[7] The total physician shortage for the county is currently estimated at 30%.[2] For many specialties, Kaua‘i residents must travel off island due to no availability of specialty care on island. This includes care in the following specialties: allergy and immunology, neonatology, pediatric cardiology, endocrinology, pulmonology, rheumatology, pediatric gastroenterology, and pediatric hematology and oncology.[2]

In addressing the physician shortage in rural and medically underserved areas, a multifaceted approach is needed. One approach is to increase the physician workforce by providing more educational and training opportunities geared towards rural populations. Training and educational experiences in rural areas has shown to be a strong predictor to practicing medicine in those areas, even stronger than having a rural background.[8,9] To provide rural educational experiences, the John A. Burns School of Medicine (JABSOM), has developed and launched the Kaua‘i Medical Training Track (KMTT). This is a medical education rural training track on the island of Kaua‘i. The KMTT offers a unique longitudinal opportunity for students to live and train within the Kaua’i community for a total of fifteen months throughout all 4 years of medical school with an additional curricular focus on the health care needs of Kaua‘i patients. Additionally, the KMTT provides a foundation to expand residency rotation opportunities and establish a family medicine residency program on Kaua‘i, which is currently seeking accreditation.

Kauaʻi Medical Training Track

The KMTT is funded by a $10 million grant from Dr. Priscilla Chan and Mark Zuckerberg family and is designed to help address the physician shortage and directly improve the health and wellness of the people of Kauaʻi. The KMTT, which is currently in the fourth of 6 total years, consists of a cohort of up to 6 students each year from the incoming class who will spend a significant portion of their training throughout medical school on the island of Kauaʻi. Medical students with strong interest in rural health, and/or connections to Kauaʻi or another neighbor island are given high preference for the track. KMTT offers scholarships covering 4-year full tuition and fees. Airfare, ground transportation, and lodging while on Kauaʻi are provided by KMTT funding. Scholarship recipients commit to practicing medicine on Kaua'i in the 4 years following residency or fellowship training in any specialty. The first cohort of students started in 2022.

Kauaʻi On-Island Student Experiences

During the first semester, students start with 2 weekend trips to Kauaʻi to learn about the island and participate in community service activities. This is followed by a 4-day visit to Lanaʻi to explore how other rural communities and their health systems navigate the challenges of rural health care. Throughout preclinical first and second years of medical school, students complete an MD-program "unit" on island mentored by a Kauaʻi based faculty member. In addition to their classroom-based coursework, students learn about the Kauaʻi community, participate in service learning, and practice their clinical skills. The third cohort of students, who are in the first year of medical school, will be living on Kauaʻi during their fourth academic block which takes place over 9 weeks in Spring 2025. During the summer, this cohort will spend an additional 4 weeks on Kauaʻi engaged in clinical shadowing, research, or public health activities.

During the clinical third and fourth years of medical school, students live on Kauaʻi for their outpatient clerkship semester and experience several additional clinical rotations and electives. Over the past 2 years, the curriculum has refined clinical skills education and added more in-person activities such as personal advising with faculty, public health activities with the Kauaʻi District Health Office, and exposure to a greater variety of clinical shadowing opportunities.

Kauaʻi Community Engagement

Community engagement continues to be a foundational objective of the KMTT. At a welcoming reception in August 2023, both cohorts of students met Kauaʻi community stakeholders to better understand the health care challenges on Kauaʻi. The second-year students worked with Health Services Pathway students at Kauaʻi High School to discuss various pathways into medicine for rural high school students and to practice clinical skills specifically utilized in adolescent patients. As part of National Public Health Week, the first-year students represented JABSOM at the Kauaʻi District Health Office Health Fair. They also participated in Teen Health Camp at Kapaʻa High School, attended a workshop on Native Hawaiian traditional healing practices, and engaged in land restoration at the McBryde Garden of the National Tropical Botanical Garden.

Kauaʻi On-Island Faculty

The excitement and planning for the KMTT resulted in stronger relationships with Kauaʻi physicians and health systems, and more clinicians interested in teaching our medical students and residents. There are now 48 total clinical physician faculty in various medical and surgical specialties on Kauaʻi. Faculty development continues with sessions that include curriculum specifically tailored to health care in rural areas and simulation-based medical education workshops. Support from health systems on Kauaʻi has also expanded and in the 2024-2025 academic year students now have rotations at 5 different sites across the island with physicians from Hawaiʻi Pacific Health (HPH), Hawaiʻi Health Systems Corporation (HHSC), and Hoʻola Lāhui, the Federally Qualified Health Center and Native Hawaiian Healthcare System for Kauaʻi. Also, KMTT students have participated in meetings to establish a pilot program on Kauaʻi to integrate behavioral health into primary care physician practices.

Kauaʻi Residency Expansion

Kauaʻi Residency Rotation Opportunities

For the last 3 years, efforts have been made to expand residency rotation opportunities on Kauaʻi island. Several meetings were held with the JABSOM department chairs, residency and fellowship program directors and their administrative staff to explore what types of future residency rotations would provide an excellent educational experience for their residents. Due to a lack of or insufficient types of medical and surgical specialties, limited breadth of patients, or lower procedural volume, residency rotations in some specialty areas would not meet accreditation requirements. The primary care specialties, such as family medicine, pediatrics, and internal medicine are more conducive to rural rotations in small communities, such as on Kauaʻi. Building on the foundation of faculty and clinical learning environment infrastructure built by the KMTT grant, graduate medical education residency elective rotations on Kauaʻi were established for the 2023-2024 academic year. New electives were created in pediatrics, family medicine, and obstetrics-gynecology. A total of 7 residents participated in these rotations. While rotations in other specialties such as primary care internal medicine and geriatrics are possible in the 2024-2025 academic year, shortage of housing is a major barrier.

Kaua‘i Family Medicine Residency Program

In 2021, the JABSOM family medicine department chair, the residency program director, and the JABSOM associate dean for academic affairs convened stakeholders from HPH, HHSC, the Kaua‘i District Health Office, Ho‘ola Lāhui, private providers, and Hawai‘i Residency Programs to draft a residency curriculum and apply for a grant through the US Health Resources and Services Administration Rural Residency Planning and Development program. To help ensure sufficient dedicated educational leaders for neighbor island medical education, JABSOM worked with the 2022 Hawai‘i State Legislature to garner additional faculty resources. The legislature approved a total of 2.0 full-time equivalent (FTE) faculty funding to expand neighbor island training sites. One FTE (a total of 5 part-time positions) is for Kaua‘i, given the need for institutional commitment for the core residency program faculty members and need for dedicated faculty in other disciplines. Recruitment is ongoing for several core faculty members who will be dually employed by JABSOM and HPH or HHSC. The state's funding combined with Kaua‘i stakeholders' commitment and resources, helped JABSOM secure a 3-year $750 000 grant in August 2023 to plan for a new JABSOM Family Medicine residency program on Kaua‘i island. Affordable housing remains a significant challenge, so the JABSOM continues to work with Kaua‘i partners to find solutions.

The proposed residency program is in the process of seeking accreditation. If granted, the first cohort of 4 family medicine residents would first complete the majority of their first year of training on O‘ahu in 2025, in specialty areas not available on Kaua‘i, then move to Kaua‘i in 2026 to complete their remaining 2 years of training. The Kaua‘i Family Medicine residents will have a unique combination of outpatient, inpatient, public health, and community-based experiences that will be tailored to the community needs of Kaua‘i island. The program aims to grow community advocates and possibly lifetime Kaua‘i residents.

Conclusion

The health and welfare of the US is at risk if the physician shortage is not addressed. There is potential for significant negative effects in the future of health care delivery, health outcomes, and would further widen health disparities in rural and underserved areas. Increased workload for physicians due to workforce shortages will lead to added stress, burnout, and potentially early retirements, which would exacerbate the situation. Solutions must be diverse and multifactorial. Increasing and optimizing telehealth will improve to health care, however, in many rural areas, and for elderly, access and utilizing broadband technology may still pose a challenge. Increasing the physician workforce through education and training, which include more exposure to rural medicine, increasing residency positions and scholarship incentives to work in rural and underserved areas, and expanding access to both international medical students and graduates can help address physician shortages.[4,5] With government legislation and funding, and community support, initiatives such as the KMTT and Family Medicine residency program on Kaua‘i island are addressing shortages and providing potential physician workforce.

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Hawai'i Journal of Health & Social Welfare
General Recommendations on Data Presentation and Statistical Reporting (Biostatistical Guideline for HJH&SW)

[Adapted from Annals of Internal Medicine & American Journal of Public Health]

The following guidelines are developed based on many common errors we see in manuscripts submitted to HJH&SW. They are not meant to be all encompassing, or be restrictive to authors who feel that their data must be presented differently for legitimate reasons. We hope they are helpful to you; in turn, following these guidelines will reduce or eliminate the common errors we address with authors later in the publication process.

Percentages: Report percentages to one decimal place (eg, 26.7%) when sample size is >=200. For smaller samples (<200), do not use decimal places (eg, 27%, not 26.7%), to avoid the appearance of a level of precision that is not present.

Standard deviations (SD)/standard errors (SE): Please specify the measures used: using "mean (SD)" for data summary and description; to show sampling variability, consider reporting confidence intervals, rather than standard errors, when possible, to avoid confusion.

Population parameters versus sample statistics: Using Greek letters to represent population parameters and Roman letters to represent estimates of those parameters in tables and text. For ex ample, when reporting regression analysis results, Greek symbol (ß), or Beta (b) should only be used in the text when describing the equations or parameters being estimated, never in reference to the results based on sample data. Instead, one can use "b" or ß for unstandardized regression parameter estimates, and "B" or ß for standardized regression parameter estimates.

***P* values:** Using *P* values to present statistical significance, the actual observed *P* value should be presented. For *P* values between .001 and .20, please report the value to the nearest thousandth (eg, *P* = .123). For *P* values greater than .20, please report the value to the nearest hundredth (eg, *P* = .34). If the observed *P* value is great than *.999*, it should be expressed as "*P* > *.99*". For a *P* value less than .001, report as "*P* < .001". Under no circumstance should the symbol "NS" or "ns" (for not significant) be used in place of actual *P* values.

"Trend": Use the word trend when describing a test for trend or dose-response. Avoid using it to refer to *P* values near but not below .05. In such instances, simply report a difference and the confidence interval of the difference (if appropriate), with or without the *P* value.

One-sided tests: There are very rare circumstances where a "one sided" significance test is appropriate, eg, non-inferiority trials. Therefore, "two-sided" significance tests are the rule, not the ex ception. Do not report one-sided significance test unless it can be justified and presented in the experimental design section.

Statistical software: Specify in the statistical analysis section the statistical software used for analysis (version, manufacturer, and manufacturer's location), eg, SAS software, version 9.2 (SAS Institute Inc., Cary, NC).

Comparisons of interventions: Focus on between-group differ ences, with 95% confidence intervals of the differences, and not on within-group differences.

***Post-hoc* pairwise comparisons**: It is important to first test the overall hypothesis. One should conduct *post-hoc* analysis if and only if the overall hypothesis is rejected.

Clinically meaningful estimates: Report results using meaningful metrics rather than reporting raw results. For example, instead of the log odds ratio from a logistic regression, authors should transform coefficients into the appropriate measure of effect size, eg, odds ratio. Avoid using an estimate, such as an odds ratio or relative risk, for a one unit change in the factor of interest when a 1-unit change lacks clinical meaning (age, mm Hg of blood pressure, or any other continuous or interval measurement with small units). Instead, reporting effort for a clinically meaningful change (eg, for every 10 years of increase of age, for an increase of one standard deviation (or interquartile range) of blood pressure), along with 95% confidence intervals.

Risk ratios: Describe the risk ratio accurately. For instance, an odds ratio of 3.94 indicates that the outcome is almost 4 times as likely to occur, compared with the reference group, and indicates a nearly 3-fold increase in risk, not a nearly 4-fold increase in risk.

Longitudinal data: Consider appropriate longitudinal data analyses if the outcome variables were measured at multiple time points, such as mixed-effects models or generalized estimating equation approaches, which can address the within-subject variability.

Sample size, response rate, attrition rate: Please clearly indicate in the methods section: the total number of participants, the time period of the study, response rate (if any), and attrition rate (if any).

Tables (general): Avoid the presentation of raw parameter estimates, if such parameters have no clear interpretation. For instance, the results from Cox proportional hazard models should be presented as the exponentiated parameter estimates, (ie, the hazard ratios) and their corresponding 95% confidence intervals, rather than the raw estimates. The inclusion of *P*-values in tables is unnecessary in the presence of 95% confidence intervals.

Descriptive tables: In tables that simply describe characteristics of 2 or more groups (eg, Table 1 of a clinical trial), report averages with standard deviations, not standard errors, when data are nor mally distributed. Report median (minimum, maximum) or median (25th, 75th percentile [interquartile range, or IQR]) when data are not normally distributed.

Figures (general): Avoid using pie charts; avoid using simple bar plots or histograms without measures of variability; provide raw data (numerators and denominators) in the margins of meta-analysis forest plots; provide numbers of subjects at risk at different times in survival plots.

Missing values: Always report the frequency of missing variables and how missing data was handled in the analysis. Consider add ing a column to tables or a footnote that makes clear the amount of missing data.

Removal of data points: Unless fully justifiable, all subjects included in the study should be analyzed. Any exclusion of values or subjects should be reported and justified. When influential observations exist, it is suggested that the data is analyzed both with and without such influential observations, and the difference in results discussed.

Guidelines for Publication of Hawai'i Journal of Health & Social Welfare Supplements

The Hawai'i Journal of Health & Social Welfare (HJH&SW) partners with organizations, university divisions, and other research units to produce topic-specific issues of the journal known as supplements. Supplements must have educational value, be useful to HJH&SW readers, and contain data not previously published elsewhere. Each supplement must have a sponsor(s) who will work with the HJH&SW staff to coordinate all steps of the process. Please contact the editors at hjhsw@hawaii.edu for more information if you would like to pursue creating a supplement.

The following are general guidelines for publication of supplements:

1. Organizations, university divisions, and other research units considering publication of a sponsored supplement should consult with the HJH&SW editorial staff to make certain the educational objectives and value of the supplement are optimized during the planning process.

2. Supplements should treat broad topics in an impartial and unbiased manner. They must have educational value, be useful to HJH&SW readership, and contain data not previously published elsewhere.

3. Supplements must have a sponsor who will act as the guest editor of the supplement. The sponsor will be responsible for every step of the publication process including development of the theme/concept, peer review, editing, preliminary copy editing (ie, proof reading and first round of copy editing), and marketing of the publication. HJH&SW staff will only be involved in layout, final copy editing and reviewing final proofs. It is important that the sponsor is aware of all steps to publication. The sponsor will:

a. Be the point of contact with HJH&SW for all issues pertaining to the supplement.

b. Solicit and curate articles for the supplement.

c. Establish and oversee a peer review process that ensures the accuracy and validity of the articles.

d. Ensure that all articles adhere to the guidelines set forth in journal's Instructions to Authors page (https://hawaiijournalhealth.org/authors.htm), especially the instructions for manuscript preparation and the statistical guidelines.

e. Obtain a signed Copyright Transfer Agreement for each article from all authors.

f. Comply with all federal, state, and local laws, rules, and regulations that may be applicable in connection with the publication, including ensuring that no protected health information appears in any article.

g. Work with the editorial staff to create and adhere to a timeline for the publication of the supplement.

h. Communicate any issues or desired changes to the HJH&SW staff in a timely manner.

4. Upon commissioning a supplement, the sponsor will be asked to establish a timeline for the issue which the sponsor and the HJH&SW editor(s) will sign. The following activities will be agreed upon with journal publication to take place no later than 24 months after signing. Extensions past the 24 months will be subject to additional fees based on journal publication rates at that time:

- Final date to submit a list of all articles, with working titles and authors
- Final date for submitting Word documents for copy editing
- Final date for submitting Word documents for layout
- Final date to request changes to page proofs (Please note that changes to page proofs will be made only to fix any errors that were introduced during layout. Other editing changes will incur an additional fee of $50 per page.)

5. The cost of publication of a HJH&SW supplement is $6,000 for an 8-article edition with an introduction from the sponsor or guest editor. Additional articles can be purchased for $500 each with a maximum of 12 articles per supplement. This cost covers one round of copy editing (up to 8 hours), layout, online publication with an accompanying press release, provision of electronic files, and indexing in PubMed Central, SCOPUS, and Embase. The layout editor will email an invoice for 50% of the supplement to the designated editor for payment upon signature of the contract. The remaining will be due at the time of publication. Checks may be made out to University Health Partners.

6. The sponsor may decide to include advertisements in the supplement in order to defray costs. Please consult with the HJH&SW advertising representative Michael Roth at 808-595-4124 or email rothcomm@gmail.com for assistance.

7. Supplement issues are posted on the HJH&SW website (https://hawaiijournalhealth.org) as a full-text PDF (both of the whole supplement as well as each article). An announcement of its availability will be made via a press release and through the HJH&SW email distribution list. Full-text versions of the articles will also be available on PubMed Central.

8. It is the responsibility of the sponsor to manage all editorial, marketing, sales, and distribution functions. If you need assistance, please contact the journal production editor. We may be able to help for an additional fee.

9. The editorial board reserves the right of final review and approval of all supplement contents. The HJH&SW will maintain the copyright of all journal contents.

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Style Guide for the Use of Native Hawaiian Words and Diacritical Markings

The HJH&SW encourages authors to use the appropriate diacritical markings (the ‘okina and the kahakō) for all Hawaiian words. We recommend verifying words with the Hawaiian Language Dictionary (http://www.wehewehe.org/) or with the University of Hawai‘i Hawaiian Language Online (http://www.hawaii.edu/site/info/diacritics.php).

Authors should also note that Hawaiian refers to people of Native Hawaiian descent. People who live in Hawai‘i are referred to as Hawai‘i residents.

Hawaiian words that are not proper nouns (such as keiki and kūpuna) should be written in italics throughout the manuscript, and a definition should be provided in parentheses the first time the word is used in the manuscript.

Examples of Hawaiian words that may appear in the HJH&SW:

‘āina	**Kaua‘i**	**O‘ahu**
Hawai‘i	**Lāna‘i**	**‘ohana**
kūpuna	**Mānoa**	**Wai‘anae**

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