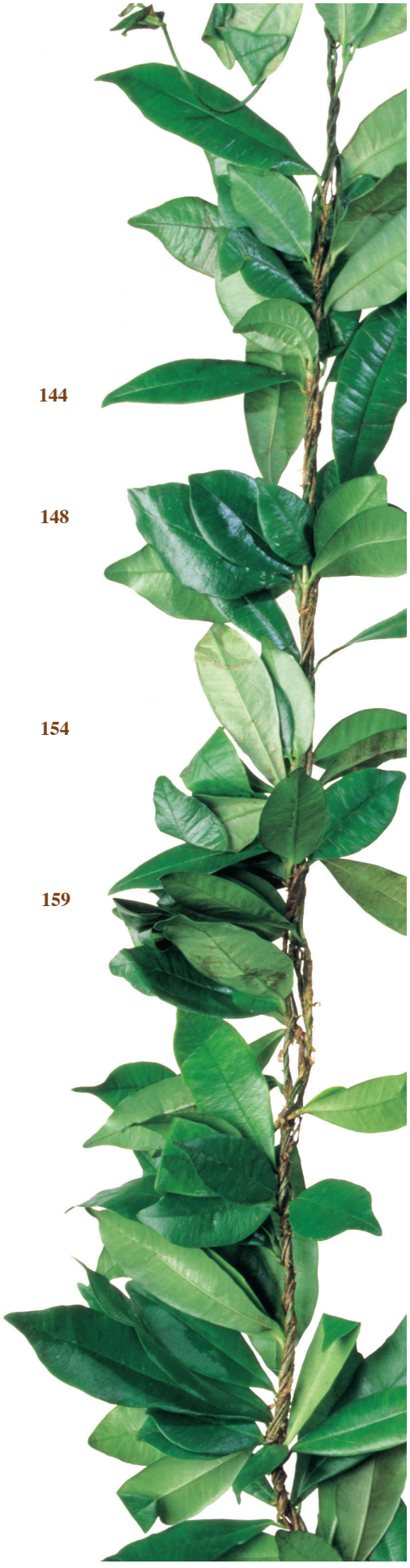
Hawai‘i Journal of Health & Social Welfare

A Journal of Pacific Health & Social Welfare

August 2025, Volume 84, No. 8, ISSN 2641-5216



Hawai‘i Journal of Health & Social Welfare

ISSN 2641-5216 (Print), ISSN 2641-5224 (Online)

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Chang AN, Kiyokawa M, Grysman N. Cocaine Induced Postictal Psychosis: a Rare Cause of Antipsychotic Resistant Psychosis. *Hawaii J Health Soc Welf*. 2025;84(8):144-147. doi:10.62547/NMIQ4624

Cocaine Induced Postictal Psychosis: a Rare Cause of Antipsychotic Resistant Psychosis

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Keywords: addiction, cocaine, postictal psychosis, antipsychotics and benzodiazepines

https://doi.org/10.62547/NMIQ4624

Abstract

Cocaine induced postictal psychosis is a rare and underreported phenomenon. When patients ingest large amounts of cocaine, patients can experience seizures. Despite returning to baseline after several days to weeks, patients can suddenly decompensate, exhibiting what is called postictal psychosis despite being abstinent from the substance. This condition can lead to chronic psychosis if not properly treated. In this case, a male in his twenties, presented with 1 month of auditory hallucinations, visual hallucinations, and paranoid delusions. After his last cocaine use 1 month ago, the patient developed seizure-like activity and shortly after returned to baseline. Approximately 1 week later, the patient started to experience psychosis. Due to persistent symptoms, the patient was admitted and started on Risperidone 2mg twice a day but did not respond. Clonazepam 1mg twice a day was added, which helped patient to return to baseline. Cocaine induced postictal psychosis is underreported, and it can be difficult to recognize. Similarly, there are few guidelines as to how to treat this condition. Clinicians need to rapidly address if they suspect that the patient is experiencing possible postictal psychosis given that this can lead to chronic psychosis.

Background

Seizures are defined as alterations of normal neurologic function, primarily caused by excessive hypersynchronous discharge from neurons in the brain and can be caused by drugs, such as cocaine.[1,2] Cocaine is a stimulant derived from coca leaves in South America and can cause psychosis, lasting hours to a few days.[3] Cocaine can induce seizures, however, the majority of cases are managed without hospital admissions.[2] There are a handful of case reports, most notably involving patients ingesting massive cocaine amounts; another way to induce seizures is through "kindling" where there is a repetitive administration of subconvulsive doses of cocaine leading to status epilepticus.[2]

Once a seizure subsides, patients may experience symptoms such as confusion, drowsiness, and headaches, which can last between 5 to 30 minutes. This is also known as postictal state. After being in a postictal state, patients return to baseline.[3] In postictal psychosis, despite several days to weeks after returning to this baseline, patients can suddenly decompensate, or get worse. This includes exhibiting psychotic symptoms including thought disorders, auditory and visual hallucinations, and paranoid delusions, which can last between 15 hours to less than 2 months.[4] Annual incidence of postictal psychosis is estimated at 6.4%,[5] and has been associated with epilepsy. Overall, postictal psychosis is not benign and can lead to chronic psychosis.[5] This highlights the need to diagnose and rapidly treat the patient if the clinician suspects that the patient is experiencing postictal psychosis.

A case of a man with a history of cocaine-induced seizure and psychosis, who presented with 1 month of psychosis after experiencing an episode of cocaine-induced seizure is presented.

Case Report

A male in his late twenties with a significant history of cocaine use (documented in the charts and from self-reports from patient) and depression presented to the Queens Medical Center-Punchbowl with auditory and visual hallucinations lasting for 1 month. The patient was sober for 7 months but relapsed 3 months prior to admission, using cocaine intermittently. His family members noted that he was having auditory hallucinations, which lasted 1 to 2 days after each cocaine use. One month prior to admission, the patient was living with his family. The patient's sister found him unconscious, "stuck" on the stair case, and unable to move. The patient's body was stiff with his shoulders shrugging up and down, which lasted for a few minutes. Shortly after, the patient went back to his baseline. Five years prior, the patient had a similar episode after using cocaine and there were concerns that he had a seizure. In the emergency department, however, the brain computerized tomography (CT) scan and electroencephalogram (EEG) were normal. On exam, the patient was noted to have blood in his mouth, but no urinary incontinence or tongue lacerations were seen on exam. After this emergency department visit, family did not seek additional medical care.

Several days after the momentary paralysis activity on the staircase, the family noted the patient started to exhibit psychotic symptoms, including auditory hallucinations, visual hallucinations, and paranoid delusions, which did not resolve. Due to persistent psychotic symptoms, the outpatient physician urged the patient to be admitted to the emergency department for further workup where most notably the patient's lab work, including urine drug screen, was negative. The patient was admitted to the inpatient psychiatric unit and was prescribed risperidone 2mg twice a day for his psychosis. However, the patient had a minimal response to risperidone. His family members, and later the patient, confirmed that his last cocaine use was about 1 month prior to admission, around the same time as when he experienced momentary paralysis in the stairwell. Given

Table 1. Logsdail and Toone's Criteria for Postictal Psychosis[7]

1-Episode of psychosis developed within one week after a seizure or a cluster of seizures.
2-Psychosis lasting at least 15 hours and less than 2 months.
3-Mental state characterized by delirium or delusions (paranoid, non-paranoid, delusional, misidentifications) or hallucinations (auditory, visual, somatosensory, olfactory) in clear consciousness.
4-No evidence of:
(a)Previous history of treatment with antipsychotic medication or evidence of psychosis within the past three months. (b)Antiepileptic drug toxicity. (c)EEG evidence of non-convulsive status epilepticus.

that there were concerns for postictal psychosis, clonazepam 1mg twice a day was also added to the regimen on the 3rd day of hospitalization, which helped the patient return to his baseline by the 4th hospital day. On the 5th hospital day, an EEG was completed given that the patient was no longer agitated, and the EEG results were normal. At the time of discharge, the patient denied any auditory and visual hallucinations.

Discussion

Cocaine is a psychostimulant, which can cause psychosis independent of seizures. In the state of Hawai'i, stimulants including methamphetamine and cocaine have contributed to significant hospitalizations with methamphetamine-related hospitalizations having risen from 532 hospitalized patients a year in 2009 to more than 2100 hospitalized patients a year in 2019.[6] Although cocaine use is less common than methamphetamine use in Hawai'i, the rates of cocaine hospitalizations have also risen by two-fold in the last decade.[6] In 2009, there were 167 patients hospitalized due to cocaine. By 2019, the number had risen to about 312 patients. Therefore, cocaine and its effects should continue to be clinically monitored by medical providers in Hawai'i.

Providers in this case were concerned that the patient had been unresponsive to the risperidone which commonly works well to manage stimulant-induced psychosis. Therefore, providers evaluated whether other diagnoses and therefore treatments were better suited for the patient. When evaluating postictal psychosis diagnosis for this patient, providers looked to the Logsdail and Toone's criteria for postictal psychosis[7] (see **Table 1**). Given that cocaine is a short acting psychostimulant, intoxication as well as withdrawal were unlikely to be the primary causes of patient's underlying psychosis, lasting for 1 month. The patient was started on risperidone due to the treatment recommendations based on stimulant-induced psychosis as well as possible postictal psychosis, as antipsychotics are a common treatment for substance-induced psychosis. Both first-generation antipsychotics and second-generation antipsychotics are equally efficacious. The team chose to first prescribe the patient risperidone as there was less likely to be drug-drug interactions and there was a lower seizure risk associated with this antipsychotic.[7] However, the patient was minimally responsive to treatment.

The recommended treatment for postictal psychosis consists of both an antipsychotic and a benzodiazepine.[4] Given the limited literature available, it is unclear how this combination works to treat postictal psychosis, however, in animal models both antipsychotic and benzodiazepines are shown to have additive effects; benzodiazepines are antagonists to the central nervous system (CNS), while the antipsychotics can mediate the neurotransmitters, dopamine and serotonin.[8] The theory is that cocaine over activates the CNS sympathetic system through dopamine, muscarinic, and sigma receptors and these therapies work to reverse these effects.[8] It is therefore important for providers to be cognizant of cocaine postictal psychosis as the treatment differs from substance induced psychosis. Not only is an antipsychotic required, but benzodiazepine may also be warranted. While the downstream effects specific to postictal cocaine psychosis are unknown, there is an elevated risk of the postictal psychosis progressing to chronic psychosis when it is not treated.[9] This highlights the need to rapidly address this condition if the clinician suspects that the patient is experiencing postictal psychosis.

Limitations

There were several limitations to this case report. Although the patient denied ever using methamphetamine, the authors cannot rule out methamphetamine or other substance induced psychosis as cocaine may contain contaminants. Although his urine drug screen was negative, it is important to remember that urine drug screens are screeners and cannot definitively say whether patient has used a substance. The result may have been a false negative and therefore would have required a confirmatory test to be completed. However, the patient improved during hospitalization prior to the confirmatory tests being completed. Patients can exhibit methamphetamine induced psychosis due to seizures however this is less common. Due to its longer half-life, mmethamphetamine more commonly can cause psychosis that has a longer duration compared to cocaine. Current national drug trends show that cocaine can be contaminated with fentanyl. Another concern was that although the urine drug screen was negative and the patient stated his last drug use was the prior month, interim drug use within the month cannot be definitively ruled out. It also must be pointed out that while the patient was started on an antipsychotic and did not respond to treatment for sev-

eral days, it is unclear whether the patient would have responded had the team tried another antipsychotic or waited for a longer period. It is unclear how long it would take an antipsychotic to fully reverse substance induced psychosis given that it is heavily dependent on the amount ingested as well as the extent of chronic drug use. While a primary psychiatric disorder was initially considered, ultimately it was less likely as the patient had no family history of schizophrenia and denied any prodromal symptoms including cognitive decline and changes in mood and behavior. Still, given that the treatment team evaluated the patient for a short duration in the setting of an acute hospitalization, a primary psychotic disorder cannot be definitively ruled out.

Conclusion

Health care providers should consider cocaine induced postictal psychosis when a patient presents with a recent history of cocaine induced seizures and now exhibits psychotic symptoms. Given such a clinical diagnosis, providers should consider treating the symptoms with both an antipsychotic and a benzodiazepine. Without treatment, patients risk experiencing chronic psychosis, which may result in self-harm or harm to others.

Sources of support/funding for the work

No sources of funding to report

Conflicts of interest

None

Written consent was obtained from the patient to report their case in the medical literature. IRB approval provided by University of Hawai‘i: RA-2023-022

Submitted: May 17, 2024 PDT. Accepted: March 26, 2025 PDT. Published: July 07, 2025 PDT.

References

1. Majlesi N, Shih R, Fiesseler FW, Hung O, Debellonio R. Cocaine-associated seizures and incidence of status epilepticus. *West J Emerg Med*. 2010;11(2):157-160. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2908651/

2. Stafstrom CE, Carmant L. Seizures and Epilepsy: an Overview for Neuroscientists. *Cold Spring Harb Perspect Med*. 2015;5(6):a022426-a022426. doi:10.1101/cshperspect.a022426

3. Clinical features of cocaine-induced paranoia. *Am J Psychiatry*. 1991;148(4):495-498. doi:10.1176/ajp.148.4.495

4. Abood W, Bandyopadhyay S. Postictal Seizure State. In: *StatPearls [Internet]*. StatPearls Publishing; 2023. Accessed January 2024. https://www.ncbi.nlm.nih.gov/books/NBK526004/

5. Morrow EM, Lafayette JM, Bromfield EB, Fricchione G. Postictal psychosis: presymptomatic risk factors and the need for further investigation of genetics and pharmacotherapy. *Ann Gen Psychiatry*. 2006;5:9. doi:10.1186/1744-859X-5-9

6. Queen's Medical Center on "losing end" of battle with meth. Honolulu Civil Beat. November 12, 2019. https://www.civilbeat.org/2019/11/queens-medical-center-at-losing-end-of-battle-with-meth/

7. Logsdail SJ, Toone B. Post-Ictal Psychoses. *Br J Psychiatry*. 1988;152(2):246-252. doi:10.1192/bjp.152.2.246

8. Heard K, Cleveland NR, Krier S. Benzodiazepines and antipsychotic medications for treatment of acute cocaine toxicity in animal models – A systematic review and meta-analysis. *Hum Exp Toxicol*. 2011;30(11):1849-1854. doi:10.1177/0960327111401435

9. Smith SJM. EEG in the diagnosis, classification, and management of patients with epilepsy. *J Neurol Neurosurg Psychiatry*. 2005;76(suppl_2):ii2-ii7. doi:10.1136/jnnp.2005.069245

Sonnleitner ML, Snyder EM, Johnson FA, et al. Evaluating Medical Students' Confidence in Musculoskeletal Examination: Implications for Improving Musculoskeletal Medicine Education. *Hawaii J Health Soc Welf*. 2025;84(8):148-153. doi:10.62547/MLTR2588

Evaluating Medical Students' Confidence in Musculoskeletal Examination: Implications for Improving Musculoskeletal Medicine Education

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Keywords: medical education, physical examination, education assessment, medical school

https://doi.org/10.62547/MLTR2588

Abstract

In response to feedback from previous medical students, the office of medical education at a state-funded medical school (University of Hawaii) conducted an IRB-approved survey study to formally evaluate the experience of current medical students regarding their confidence with MSK examination skills, and solicited suggestions for improvement. We collected data from students who were transitioning from second to third year regarding the following: (1) confidence in various physical exams, (2) perceived preparedness for clerkships, (3) usefulness of existing MSK clinical activities, and (4) suggestions for improvement. A majority of students expressed lack of confidence in the MSK physical exam, which was notably lower than other organ system exams. Recommendations for curriculum improvement included early integration of MSK examination teaching with corresponding anatomy laboratory sessions, inclusion of physiatry teaching, and increased small-group learning sessions. This study revealed the need for (1) synchronizing MSK clinical skills training with anatomy curriculum during the first year, and (2) inclusion of physiatry teaching in the MSK curriculum. Ideally, this study will serve as a starting point for further innovations and improvements in MSK medical education.

Abbreviations and Acronyms

HOME = Houseless Outreach & Medical Education
MSK = musculoskeletal
OME = Office of Medical Education
PBL = problem-based learning

Introduction

Musculoskeletal (MSK) conditions are common across various clinical settings.[1] About 20% of primary care and emergency department visits are related to MSK conditions.[2] However, several studies have revealed that medical students do not feel properly equipped with the knowledge and skills for MSK examination,[3,4] especially when compared with their physical examination skills of other organ systems.[3] Yu et al suggested that one of the challenges medical students face in learning MSK medicine is the complexity of integrating basic and clinical science knowledge and applying them in clinical scenarios.[3,4] There is no clear agreement on how to address this issue despite many endeavors to improve MSK curricula.

Traditionally, the Office of Medical Education (OME) at this institution incorporates several MSK cases into problem-based learning (PBL) sessions during the second year of medical school. MSK anatomy dissection sessions and their associated didactics take place weekly for 3 months during the first year of medical school. Pre-dissection didactics incorporate dissection techniques and anatomy structures as they relate to pathology presented in the concurrent PBL sessions. Preclinical students also attend 3 clinical education sessions, 2 of them during the second-year curriculum and 1 more session prior to starting third year rotations. These sessions include: (1) rheumatology clinical skills session (75 minutes per group), beginning with a didactic presentation followed by MSK examination supervised by 2 rheumatologists; (2) orthopedic clinical skills session (4 hours per group), during which students receive an introductory didactic presentation followed by rotations through various stations, led by orthopedic surgeons who provided hands-on demonstration of MSK examination on different body parts; and (3) "Transition to Clerkship" MSK clinical skills lab during their transition from second to third year, which is led by a primary care physician.

At this institution, medical students have informally expressed concerns over mastering the MSK clinical exam in feedback to the OME, however this has not been officially quantified. This survey aimed to provide a formal needs-assessment of MSK examination education, including curriculum adequacy and student self-confidence, in order to enhance MSK education in medical school curriculum.

Methods

This study was approved by the University's IRB office (Protocol ID: 2022-00761). Two fourth year medical students (KK and JW) worked with 3 faculty members (DL, RK and HL) to design this survey, which was modified from a previous questionnaire.[3] The overarching theme focused around the students' experiences and perspectives on their MSK teaching curriculum during the first and second years of medical school. A copy of the distributed survey is shown in **Appendix 1**. The survey included questions on institution-specific curriculum and activities surrounding educa-

tion of MSK examinations. Questions 1-5 determined the respondents' level of confidence with various physical exams, from cardiovascular, respiratory, abdominal, neurological to MSK, and their perceived level of preparedness for clerkships. Questions 6-11 assessed the perceived usefulness of the existing MSK clinical activities at this institution, including the (1) orthopedics clinical skills lab and (2) rheumatology clinical skills lab, both of which occurred during the second year of medical school, as well as the (3) "Transition to Clerkship" MSK clinical skills lab, which occurred during the transition from second to third year of medical school. Question 12 asked whether the students feel it would be helpful to have the MSK clinical skills experience during their anatomy unit on the MSK system. After the 12 Likert scale questions, the survey concluded with open-ended questions that encouraged respondents to reflect on which parts of the MSK education curriculum were most helpful to their skill development and allowed students to provide suggestions for improving the curriculum. Answers were kept anonymous to ensure honest feedback.

The survey link was emailed to the third-year student class listserv and was administered via Google Forms (Google, LLC. Mountain View, CA.). Eligible participants included students who had completed: (1) 2 years of preclinical organ-system-based curriculum (including cardiovascular, respiratory, renal, hematology, gastrointestinal, MSK, nervous, endocrine and reproductive), (2) orthopedic clinical skills lab, (3) the rheumatology clinical skills lab, and (4) "Transition to Clerkship" MSK clinical skills lab. Responses were collected from June 9, 2023 through September 4, 2023.

Data analysis

Results of the survey were analyzed using Google Sheets (Google, LLC. Mountain View, CA.) and were reported using descriptive statistics. Responses were recorded and presented in a bar graph (questions 1-5) and a table (questions 6-12). The 3 open-ended, narrative questions at the end of this survey were summarized via brief thematic analysis.

Results

Sixty-four of the 77 students (83%) in the Class of 2025 completed this survey. Regarding questions on self-confidence for physical examination, 13% of the surveyed students disagreed or strongly disagreed that they felt confident performing the MSK physical exam, compared to 3% for cardiovascular, 2% for respiratory, 2% for abdominal, and 7% for neurological physical exams (**Figure 1**). The MSK physical exam was also the only item to receive a "strongly disagree" rating. The respiratory and abdominal exams yielded the highest rates of either "agree" or "strongly agree" (both 98%), while the respiratory exam yielded the highest rate of "strongly agree" (27%).

In questions 6-12, more than 90% of students reported positive feedback (strongly agree and agree) regarding their Orthopedics experience, Rheumatology clinical experience, and Transition to Clerkship MSK clinical skills lab (**Table 1**). The Orthopedics experience received the most strongly agree ratings (50%) and 42% agree ratings. Twenty five percent of students "strongly agreed" and 70% of students "agreed" that the Transition to Clerkship MSK clinical skills lab was helpful. For the Rheumatology experience, 22% strongly agreed that it was helpful, with 69% agreeing. Two students (3%) strongly disagreed that the Rheumatology experience was helpful. In question 12, 98% of students agreed (with 50% agreeing, and 48% strongly agreeing) that adding clinical MSK skills to their corresponding MSK anatomy unit would be helpful.

Finally, the students were asked 3 open-ended questions: (1) What part(s) of the MSK curriculum was/were the MOST helpful in strengthening your MSK physical exam skills?; (2) In what settings or situations, outside of formally scheduled class/curricular time, did you learn/practice the MSK physical exam?; and (3) Do you have any suggestions on how to improve the MSK curriculum? In response to open-ended question 1, the most helpful experiences in strengthening MSK clinical skills were the Orthopedic teaching experience and the "Transition to Clerkship MSK clinical skills lab." In open-ended question 2, students stated they learned/practiced MSK clinical skills in their Learning Communities and at Houseless Outreach & Medical Education (HOME) Clinic. In response to open-ended question 3, students reiterated that incorporating the MSK exam curriculum with the relevant anatomy unit would improve the curriculum. Students also indicated it was difficult to practice MSK examination on their own and wished to have more small group sessions, with tips to understand the knowledge behind specific joint maneuvers. In reviewing the open-ended questions, there were multiple positive comments from students about the added value of physiatry teaching in their Transition to Clerkship MSK clinical skills lab and in their PBL sessions.

Discussion

Results from this modified survey were consistent with the findings of recent publications on MSK medicine education.[3-8] Based on their educational experience in the first (2021) and second (2022) years of medical school, the students in the class of 2025 at this institution did not feel as confident in performing the MSK examination when compared to their confidence with examination of other organ systems.

It should be noted that in Question 12, almost all students (98%) strongly agreed or agreed that it would be helpful to have MSK clinical skills experience during the first year of medical school, in order to synchronize with their anatomy laboratory sessions. Other studies in the US and Canada report similar trends.[3-7] Almost all students (92%) agreed that the MSK curriculum provided adequate teaching of the MSK exam. However, they were the least confident in the physical exam when compared to other system exams. This could be because the MSK exam has a larger number of maneuvers and variation compared to other organ systems, which could contribute to decreased confidence. Additionally, while there were many opportunities for learning the MSK exam, there were fewer opportuni-

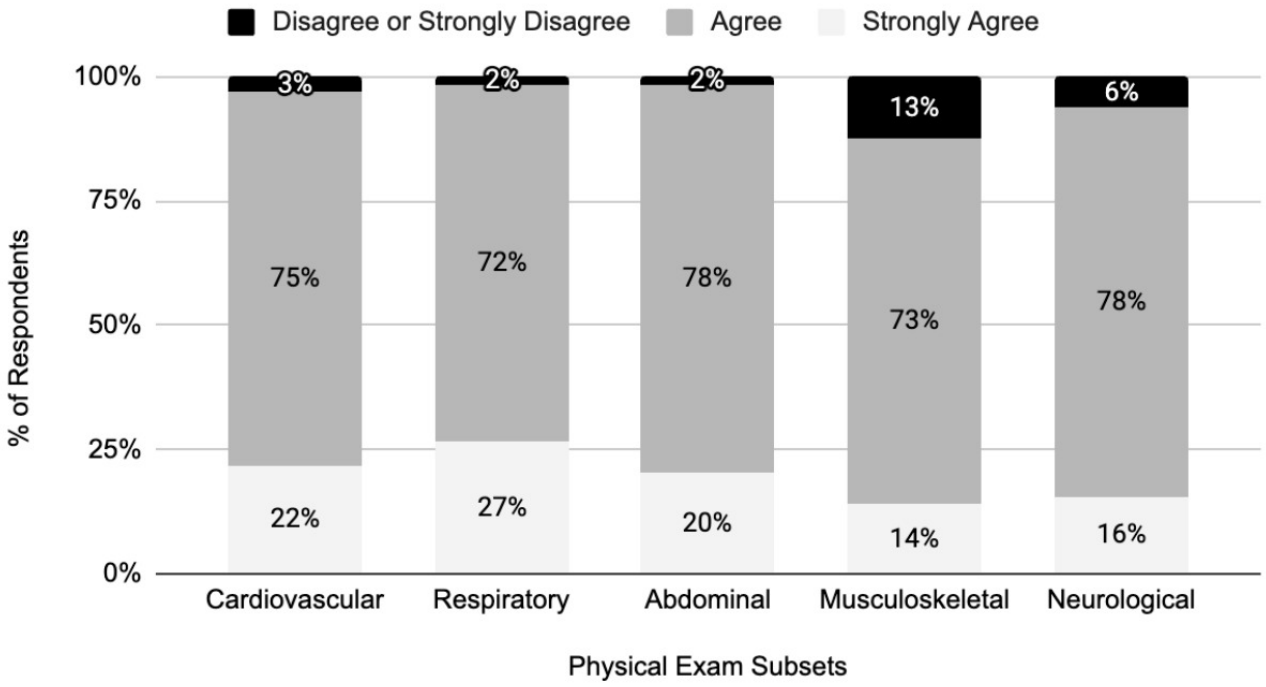

Figure 1. Student-Reported Agreement with Statements About Student Confidence in Performing Physical Exams of Different Systems (N=64) (Appendix 1, Questions 1-5).

Table 1. Student-Reported Agreement Rates with Statements About the Musculoskeletal (MSK) Curriculum at the Medical School (N=64).

Question	Strongly Agree n (%)	Agree n (%)	Disagree n (%)	Strongly Disagree n (%)
6. The MSK curriculum provided adequate teaching of the MSK physical exam.	12 (19%)	47 (73%)	5 (8%)	0 (0%)
7. I believe that my training in MSK clinical skills helped me anticipate the types of clinical issues I will encounter in my clerkships.	15 (23%)	43 (67%)	6 (9%)	0 (0%)
8. I believe that my training in MSK clinical skills has helped me develop my ability to hypothesize and generate a differential diagnosis around a patient's presenting problems.	16 (25%)	44 (69%)	4 (6%)	0 (0%)
9. I believe that the Orthopedics experience was a valuable learning experience for me.	32 (50%)	27 (42%)	5 (8%)	0 (0%)
10. I believe that the Rheumatology clinical skills lab was a valuable learning experience for me.	14 (22%)	44 (69%)	4 (6%)	2 (3%)
11. I believe that the Transition to Clerkship MSK clinical skills lab was a valuable learning experience for me.	16 (25%)	45 (70%)	3 (5%)	0 (0%)
12. It would be helpful to have MSK clinical skills experience during the anatomy unit on MSK system.	31 (48%)	32 (50%)	1 (2%)	0 (0%)

ties for practicing for the exam in full which may have further decreased confidence. Although most students felt the MSK curriculum was adequate, students' decreased confidence prompted the investigation into future curriculum improvements. Despite high curriculum approval rates, it is important that medical students feel equally confident performing all portions of the physical exam.

There are several limitations to the study. This survey was conducted at a single medical institution with a relatively small number of students, measuring student self-reported confidence and satisfaction. Descriptive statistics were used to summarize the student perspectives, but no objective measures of student competence or performance were included for comparison. In addition, this methodology did not allow for formal tests of statistical significance as there was no specific intervention or differentiating exposures being compared as all students experienced the same curriculum. Adding objective measures and correlating performance to students' confidence could be investigated in future studies. Another limitation of this study

is the potential social desirability bias among medical student survey respondents. Social desirability bias describes how survey respondents may provide a "socially acceptable" response rather than what they actually believe in order to gain approval.[9] This phenomenon is well-documented among students in higher education,[10] and could have contributed to high rates of agreement on the survey in this study. Selection bias may have been a contributory factor, as the students who chose to respond may have had stronger opinions (either positive or negative) about the MSK curriculum, potentially skewing the results. Response bias is possible as well, despite anonymous survey collection. Students could have responded more favorably to questions about curriculum effectiveness due to their familiarity with faculty members involved in curriculum design. Ideally this study will serve as a starting point for further innovations and improvements in MSK medical education.

Conclusion

This study showed a lack of confidence in performing a comprehensive MSK exam when compared to physical exams of other organ systems despite students feeling as though the curriculum itself was adequate. Students felt having more opportunities in small groups for practicing the MSK exam, as well as incorporating the MSK clinical exam into the MSK anatomy curriculum would be beneficial in increasing their confidence. Given this finding, interventions to target this lack of confidence will be implemented. These interventions include early introduction of MSK clinical examination skills to medical students during the first instead of second year of medical school. A physiatrist is assigned to work together with the anatomy department in teaching MSK examinations to future cohorts. Because the survey respondents from the class of 2025 did not have the opportunity to experience this added educational experience, the same survey will be provided to future cohorts to evaluate the effects of these additional interventions. To this end, the IRB application was updated to include the collection of objective outcomes such as anatomy examination results, and standardized patient examination results for future cohorts.

Acknowledgements

Special thanks to Dr. Jill Omori, Dr. Sheri Fong, Dr. Lee Buenconsejo-Lum, Dr. Danny Takanishi, Dr. Dennis Bolger, Dr. David Horio, and all staff at the OME for their support of this project.

Conflict of Interest and Disclosures

None of the authors identify any conflict of interest.

Disclaimers

None. No funding was received.

The datasets generated are available from the corresponding author upon reasonable request.

Submitted: April 07, 2024 PDT. Accepted: March 26, 2025 PDT. Published: July 07, 2025 PDT.

References

1. Yelin E, Weinstein S, King T. The burden of musculoskeletal diseases in the United States. *Semin Arthritis Rheum*. 2016;46(3):259-260. doi:10.1016/j.semarthrit.2016.07.013

2. Miller AN. Evaluation of common musculoskeletal injuries in the urgent setting. *MedEdPORTAL*. 2016;12:10514. doi:10.15766/mep_2374-8265.10514

3. Yu JC, Rashid M, Davila-Cervantes A, Jodgson CS. Difficulties with learning musculoskeletal physical examination skills: Student perspectives and general lessons learned for curricular design. *Teach Learn Med*. 2022;34(2):123-134. doi:10.1080/10401334.2021.1954930

4. Yu JC, Guo Q, Hodgson CS. Deconstructing the joint examination: a novel approach to teaching introductory musculoskeletal physical examination skills for medical students. *MedEdPORTAL*. 2020;16:10945. doi:10.15766/mep_2374-8265.10945

5. Truntzer J, Lynch A, Kruse D, Prislin M. Musculoskeletal education: an assessment of the clinical confidence of medical students. *Perspect Med Educ*. 2014;3(3):238-244. doi:10.1007/s40037-014-0124-1

6. DiGiovanni BF, Sundem LT, Southgate RD, Lambert DR. Musculoskeletal medicine is underrepresented in the American Medical School Clinical Curriculum. *Clin Orthop Relat Res*. 2016;474(4):901-907. doi:10.1007/s11999-015-4511-7

7. Stansfield RB, Diponio L, Craig C, et al. Assessing musculoskeletal examination skills and diagnostic reasoning of 4th year medical students using a novel objective structured clinical exam. *BMC Med Educ*. 2016;16(1):268. doi:10.1186/s12909-016-0780-4

8. Lew H, Yu D, Combs D, Cifu D. Enhancing musculoskeletal examination training in medical education [letter]. *Am J Phys Med Rehabil*. 2023;10:1097. doi:10.1097/PHM.0000000000002365

9. Bergen N, Labonté R. "Everything is perfect, and we have no problems": Detecting and limiting social desirability bias in qualitative research. *Qual Health Res*. 2020;30(5):783-792. doi:10.1177/1049732319889354

10. Miller A. Investigating social desirability bias in student self-reported surveys. *Educ Res Q*. 2012;36(1):30-47.

Appendix 1

Multiple Choice Questions:

Multiple Choice Questions (A: Strongly disagree, B: Disagree, C: Agree, D: Strongly Agree)
1. I feel confident performing the Cardiovascular physical exam.
2. I feel confident performing the Respiratory physical exam.
3. I feel confident performing the Abdominal physical exam.
4. I feel confident performing the Musculoskeletal (MSK) physical exam.
5. I feel confident performing the Neurological physical exam.
6. The MSK curriculum provided adequate teaching of the MSK physical exam.
7. I believe that my training in MSK clinical skills helped me anticipate the types of clinical issues I will encounter in my clerkships.
8. I believe that my training in MSK clinical skills has helped me develop my ability to hypothesize and generate a differential diagnosis around a patient's presenting problems.
9. I believe that the Orthopedics experience was a valuable learning experience for me.
10. I believe that the Rheumatology clinical skills lab was a valuable learning experience for me.
11. I believe that the Transition to Clerkship MSK clinical skills lab was a valuable learning experience for me.
12. It would be helpful to have MSK clinical skills experience during the anatomy unit on MSK system.

Open ended questions:

1. What part(s) of the MSK curriculum was/were the MOST helpful in strengthening your MSK physical exam skills?
2. In what settings or situations, outside of formally scheduled class/curricular time, did you learn/practice the MSK physical exam?
3. Do you have any suggestions on how to improve the MSK curriculum?

Cheng S, Su J, Kieu J, Wong A, Vierkoetter K, Marumoto A. Squamous Cell Carcinoma In Situ (SCCIS) of the Nipple Following Breast Conserving Therapy: Case Report. *Hawaii J Health Soc Welf*. 2025;84(8):154-158. doi:10.62547/VCNZ4735

Squamous Cell Carcinoma In Situ (SCCIS) of the Nipple Following Breast Conserving Therapy: Case Report

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Keywords: squamous cell carcinoma in situ, breast, radiation, case report, bowen's disease

https://doi.org/10.62547/VCNZ4735

Abstract

Background

Squamous cell carcinoma in situ (SCCIS), also known as Bowen's disease, is a precancerous intradermal lesion that commonly arises in sun-exposed areas. Other risk factors include radiation, inflammation, carcinogen exposure, and human papilloma virus exposure. Its presentation on the nipple-areolar complex is extremely rare with 14 cases reported in literature.

Case Presentation

We report a case of a postmenopausal woman with remote history of breast cancer and DCIS treated with bilateral breast conserving surgery followed by adjuvant radiation. She developed SCCIS of the right nipple nearly 30 years later. Associated symptoms included bloody nipple discharge, nipple rash, and nipple pruritus for 1.5 years. A punch biopsy of the right nipple lesion identified epithelioid cells in the intradermal space staining CK7 (+) and p40 (+)/p63 (+), classifying the lesion as Paget's disease. The patient elected to proceed with bilateral mastectomies without reconstruction. Final surgical pathology revealed radiation induced atypia and atypical keratinocytes that focally extend throughout the full epidermal thickness. Immunohistochemical staining demonstrated CK7 (-), CK5/6 (+), p40 (+), HER2 (-) and GCDFP15 (-) consistent with the diagnosis of SCCIS.

Conclusion

Paget's disease of the nipple and SCCIS may present with similar clinical and histopathologic features; however, they are managed differently. Nipple lesions in the setting of prior radiation should raise concern for SCCIS. Clinicians should be aware of this rare, but potential sequelae in patients with a history of breast cancer treated with breast conserving therapy and nipple complaints.

List of abbreviations

BCC = basal cell carcinoma
BRCA = breast cancer gene
DCIS = ductal carcinoma in situ
IHC = immunohistochemistry
SCC = squamous cell carcinoma
SCCIS = squamous cell carcinoma in situ

INTRODUCTION

Squamous cell carcinoma *in situ* (SCCIS), also known as Bowen's disease, is an intraepidermal lesion that usually arises in sun-exposed areas. It is considered an early, non-invasive form of squamous cell carcinoma (SCC) with malignant potential, first described in 1912 by dermatologist John T Bowen.[1] Annual incidence in the United States is approximately 15 per 100 000. There is a slight female predominance with most patients diagnosed in their 60s or 70s.[2-4] SCCIS usually occurs in the head and neck in men compared to the lower limbs and cheeks in women. While less common, SCCIS has also been known to occur in sun protected areas such as the torso or anogenital regions.[5] Its presentation in the breast, and specifically the nipple-areolar complex, is extremely rare with 14 case reports published in PubMed as of April 2025. This case report describes a postmenopausal woman with a history of breast cancer treated with breast conserving therapy who subsequently developed SCCIS of the nipple.

CASE PRESENTATION

This patient is a 69-year-old White female with a past medical history significant for right cheek basal carcinoma and bilateral breast cancer. In 1992 she was diagnosed with right breast ductal carcinoma *in situ* (DCIS) and underwent partial mastectomy and axillary dissection followed by adjuvant radiation. In 2004 she was diagnosed with early stage left breast hormone positive invasive ductal carcinoma and underwent partial mastectomy and axillary dissection followed by adjuvant radiation and anti-endocrine therapy. Her family history was significant for a sister and maternal aunt with breast cancer and 2 paternal cousins with breast cancer. Genetic testing revealed a breast cancer gene (BRCA) variant of uncertain significance. Her social history was notable for prior tobacco use (9 pack-year smoking history; she quit smoking 29 years ago). She initially presented to her primary care physician for new onset right bloody nipple discharge as well as rash and pruritus of 1.5 years duration.

Diagnostic work up including bilateral diagnostic mammogram and targeted right breast ultrasound were negative for suspicious findings. She was referred to a dermatologist who performed a punch biopsy. Histological analysis of the intra-epidermal lesion demonstrated broad islands and infiltrating clusters of atypical epithelioid cells. Immunohistochemical (IHC) stains demonstrated focal superficial CK7

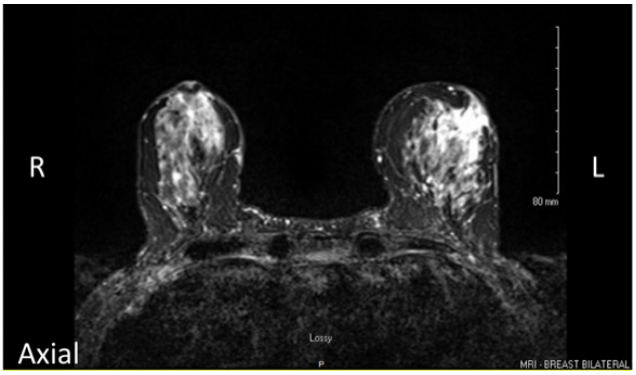

Figure 1. Bilateral Breast Magnetic Resonance Imaging.

Non-mass enhancement in the right inferior retroareolar breast.

(+) with diffuse GATA-3 expression, p40 (+), p63 (+), ER (-), PR (-) classifying the lesion as most consistent with Paget's disease with squamous differentiation. She was subsequently referred to a breast surgical oncologist.

Breast MRI was recommended and revealed an area of non-mass enhancement in the right inferior retroareolar breast for which biopsy was recommended **(Figure 1)**. MRI-guided biopsy of the right breast demonstrated focal intraductal epithelial atypia. Given the diagnosis of Paget's disease with atypia, an in-depth discussion was had with the patient and her husband regarding surgical options including breast conservation vs mastectomy. She ultimately elected to proceed with right mastectomy without reconstruction as well as contralateral risk reducing mastectomy due to her personal history of bilateral breast cancer.

Final surgical pathology demonstrated SCCIS of the right nipple with underlying radiation induced parenchymal changes **(Figures 2a-c)**. Histologically, the nipple lesion demonstrated full thickness epidermal involvement by atypical keratinocytes. IHC staining demonstrated CK7 (-), CK5/6 (+), p40 (+), HER2 (-), GCDFP15 (-), GATA 3 (+), EMA (+), and AR (focal) (+). The breast parenchyma showed changes consistent with radiation atypia, including lobular sclerosis and atrophy with foci of epithelial atypia in a background of diffuse dense stromal fibrosis. There was no recurrence observed at 3-year follow-up. The timeline of events from initial presentation to final diagnosis is summarized in **Figure 3**.

DISCUSSION

The differential diagnosis for nipple lesions and nipple pruritus includes benign and malignant etiologies. Though Paget disease of the breast represents only 1-3% of breast cancers with the highest incidence seen in the 5th decade of life, this diagnosis should be high on the differential for women with nipple lesions and pruritus.[6] It commonly presents as eczematous patches over the nipple and areolar complex, which is histologically composed of malignant intraepithelial cells, also called Paget cells. Underlying breast cancer can extend from the lactiferous ducts to the nipple epidermis, possibly due to de novo transformation of epithelial cells.[7] Paget's disease is associated with underlying breast malignancy in approximately 50% of cases, with some literature citing incidences of over 90%.[6-8] Thus, the diagnostic workup and management should be prompt and thorough.

For patients with prior history of radiation and nipple complaints, squamous cell carcinoma *in situ* (SCCIS) should also be included in the differential. If left untreated, SCCIS has a 3-5% rate of progression to invasive carcinoma.[9] Other risk factors include carcinogens such as arsenic, immunosuppression, and history of human papillomavirus (HPV) infection.[10] Sun-exposed areas such as the head, neck and extremities are commonly affected. SCCIS rarely occurs in the nipple-areolar complex. Histologically it is described as a population of atypical cells that spans across the epidermis and it is usually not associated with underlying breast malignancy. To date, there is only 1 reported case of SCCIS and concurrent breast cancer.[11] A brief comparison of Paget's disease and SCCIS is shown in **Table 1**.

Prior radiation treatment is a known risk factor for future precancerous and cancerous lesions arising at the site of radiotherapy. There are few studies regarding the incidence of radiation induced SCCIS. One case report demonstrated occupational radiation exposure induced SCCIS of the hands.[12] Another study done by Lichter et al evaluated the relative risk of developing basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) after receiving therapeutic ionizing radiation.[13] The authors found an increased risk for BCC (age and sex-adjusted OR, 1.88; 95% CI, 1.24-2.87) and for SCC although not significant (age- and sex-adjusted OR, 1.56; 95% CI, 0.95, 2.55). The study also noted an increased risk of developing BCC and SCC if the patients received their first radiation treatment prior to 20 years of age. There was a latency period of approximately 40 years before a diagnosis of SCCIS. There is also 1 documented case of a woman who developed SCC of the nipple 9 years after breast conserving surgery and adjuvant radiation for DCIS of the ipsilateral breast.[14] Similarly, the patient in this study received ionizing radiation treatment for right breast DCIS 30 years prior to her diagnosis of SCCIS.

It is important to distinguish SCCIS from Paget's disease, which may demonstrate significant clinical and histologic overlap, particularly in challenging cases. A rare subtype of SCCIS known as the pagetoid variant can closely mimic Paget's disease and presents as large, pale vacuolated cells in the epidermis; there are 3 cases reported in the literature.[15] SCCIS and Paget's disease are, however, fundamentally different in pathogenesis, histopathological features, and treatment.

Diagnostic work-up of a nipple or skin lesion requires a full thickness biopsy through the nipple and areola or complete excision followed by comprehensive IHC analysis of the tissue sample. Distinct histopathological features of SCCIS include full-thickness epidermal atypia, abnormal mitosis, and dyskeratosis. In comparison, Paget's disease demonstrates the presence of intraepidermal spread of Paget cells (cells with large, pale, abundant clear cytoplasm, atypical nuclei and prominent nucleoli) on histology.

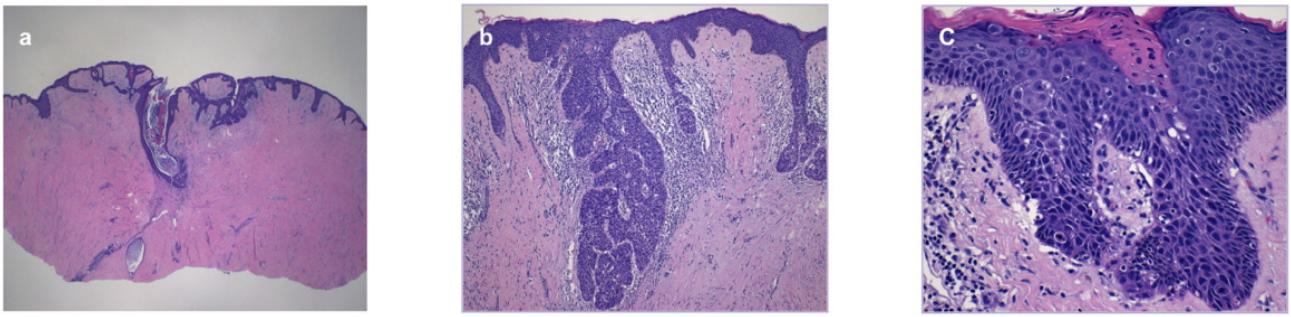

Figure 2. Histology of Nipple Specimen

(a) Nipple with squamous cell carcinoma in situ extending into the lactiferous duct. H&E, 20x. (b) Squamous epithelium with full thickness atypia; scattered mitotic figures and dyskeratotic cells are present. H&E, 100x. (c) Squamous epithelium demonstrating atypical intraepidermal keratinocytic proliferation with pagetoid spread of pale to clear-staining atypical keratinocytes. H&E, 400x.

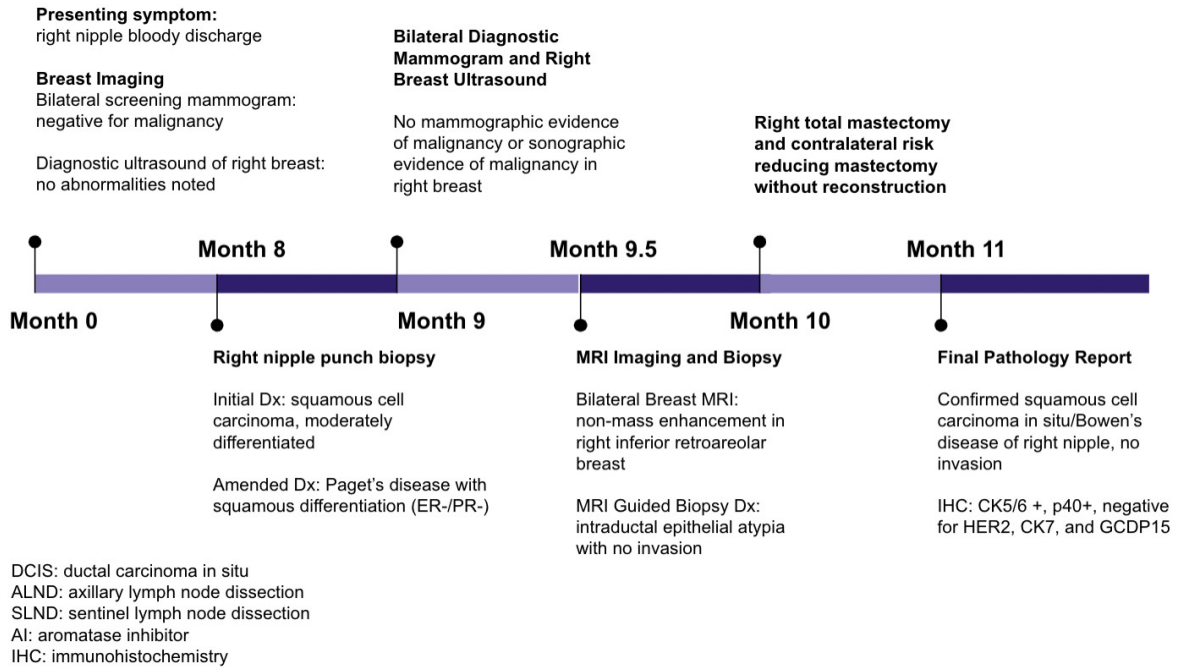

Figure 3. Timeline of Events of Symptom Presentation, Diagnosis and Treatment

In this report, the initial punch biopsy demonstrated histologic staining consistent with Paget's disease with squamous cell differentiation given positive staining for CK7 and p40/p63. However, surgical pathology of the lesion demonstrated IHC staining consistent with SCCIS: CK7 (-), CK5/6 (+), p40 (+), HER2 (-) and GCDFP15 (-). What made the final diagnosis particularly challenging was the presence of aberrant CK7 staining, pagetoid spread, marked inflammation, and radiation induced atypia of the breast parenchyma. Although it is known that radiation of breast tissue can induce atypia, the propensity for inducing primary SCCIS in the breast is understudied. This report highlights key clinicopathologic features that may arise as a late complication of radiation.

Surgical resection is the primary treatment modality for Paget's disease. This entails a mastectomy with axillary staging or central lumpectomy followed by radiation. This is in contrast to SCCIS for which treatment options vary and include topical creams (ie 5-fluorouracil, Imiquimod), photodynamic therapy, cryotherapy, and surgical excision.[10] With the drastically different treatment regimens, it is imperative to attain an accurate diagnosis.

The patient was very grateful to have undergone a risk reducing procedure given her personal history of breast cancer and extensive work up in the past which was anxiety provoking. This contributed to her decision to elect for bilateral mastectomies. Given that the nature of disease was radiation induced given the radiation atypia histology seen in the breast, it may have complicated future screening leading to more anxiety. Overall, the patient is happy with the risk reduction and outcome.

CONCLUSION

This case illustrates a rare cause of nipple lesion and demonstrates the need to include SCCIS in the differential

Table 1. Comparison of Paget's and Squamous Cell Carcinoma *in situ* (SCCIS)

	Paget's Disease	SCCIS (Bowen's Disease)
Clinical Features	Eczematous patches ± pruritus, tingling, erythema, discharge	
Underlying Breast Malignancy	Yes, ~50% of the time	No
Pathological Features	Paget cells (large, pale, abundant clear cytoplasm, atypical nuclei with prominent nucleoli)	Full-thickness epidermal atypia, pleomorphic abnormal mitoses, giant cells with multiple nuclei, and dyskeratosis
Immunohisto-chemical Features	LMWCK (+) p40/p63 (-) CK7 (+) CK 5/6 (-) GCDFP-15 (+) HER2 (+)	HMWCK (+) p40/p63(+) CK7 (-) CK 5/6 (+) GCDFP-15 (-) HER2 (-)
Treatment	Mastectomy with axillary staging or central lumpectomy with radiation	Topical creams (ie 5-fluorouracil, imiquimod), photodynamic therapy, cryotherapy, or surgical excision

diagnosis for patients with a history of breast cancer treated with adjuvant radiation who present with nipple complaints. While Paget's disease of the nipple is more clinically recognized, patients with a history of radiation to the breast should raise concern for SCCIS. Clinicians should be aware of this rare sequela of breast cancer treatment.

ACKNOWLEDGEMENT

Thank you to the patient who allowed the writers to share her case.

FUNDING AND CONFLICTS OF INTEREST DISCLOSURE

The authors have no conflicts of interest to declare. The study was performed as part of the University of Hawai'i John A Burns School of Medicine.

Authors' contributions

Shirley Cheng wrote the main manuscript text, prepared manuscript figures, and performed the literature review. Jared Su revised the manuscript. Jessica Kieu revised the manuscript. Amelia Wong revised the manuscript. Koah Vierkoetter prepared manuscript figures and revised the manuscript. Ashley Marumoto collected patient information and revised the manuscript. All authors reviewed and approved the final version of the manuscript.

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Submitted: June 16, 2024 PDT. Accepted: May 18, 2025 PDT.
Published: July 07, 2025 PDT.

References

1. Bowen JT. Centennial paper. May 1912 (J Cutan Dis Syph 1912;30:241-255). Precancerous dermatoses: a study of two cases of chronic atypical epithelial proliferation. By John T. Bowen, M.D., Boston. *Arch Dermatol*. 1983;119(3):243-260. doi:10.1001/archderm.1983.01650270061020

2. Chute CG, Chuang TY, Bergstralh EJ, Su WP. The subsequent risk of internal cancer with Bowen's disease. A population-based study. *JAMA*. 1991;266(6):816-819. doi:10.1001/jama.1991.03470060078030

3. Kovács A, Yonemoto K, Katsuoka K, Nishiyama S, Harhai I. Bowen's disease: statistical study of a 10 year period. *J Dermatol*. 1996;23(4):267-274. doi:10.1111/j.1346-8138.1996.tb04011.x

4. Cox NH. Body site distribution of Bowen's disease. *Br J Dermatol*. 1994;130(6):714-716. doi:10.1111/j.1365-2133.1994.tb03407.x

5. Kossard S, Rosen R. Cutaneous Bowen's disease. An analysis of 1001 cases according to age, sex, and site. *J Am Acad Dermatol*. 1992;27(3):406-410. doi:10.1016/0190-9622(92)70208-w

6. Caliskan M, Gatti G, Sosnovskikh I, et al. Paget's disease of the breast: the experience of the European Institute of Oncology and review of the literature. *Breast Cancer Res Treat*. 2008;112(3):513-521. doi:10.1007/s10549-007-9880-5

7. Inglis K. The essential difference between the epidermal changes in Paget's disease of the nipple and those in Bowen's precancerous dermatosis. *J Pathol Bacteriol*. 1952;64(3):637-643. doi:10.1002/path.1700640324

8. Scardina L, Di Leone A, Magno S, et al. Paget's disease of the breast: Our 20 years' experience. *Front Oncol*. 2022;12:995442. doi:10.3389/fonc.2022.995442

9. Kao GF. Carcinoma arising in Bowen's disease. *Arch Dermatol*. 1986;122(10):1124-1126. doi:10.1001/archderm.1986.01660220042010

10. Morton CA, Birnie AJ, Eedy DJ. British Association of Dermatologists' guidelines for the management of squamous cell carcinoma in situ (Bowen's disease) 2014. *Br J Dermatol*. 2014;170(2):245-260. doi:10.1111/bjd.12766

11. Yamaguchi K, Matsunuma R, Kumeta T, et al. Concurrent Bowen's disease of the nipple and breast cancer. *Case Rep Oncol*. 2020;13(3):1410-1414. doi:10.1159/000511565

12. Modi G, Jacobs AA, Orengo IF, McClung A, Rosen T. Combination therapy with imiquimod, 5-fluorouracil, and tazarotene in the treatment of extensive radiation-induced Bowen's disease of the hands. *Dermatol Surg*. 2010;36(5):694-700. doi:10.1111/j.1524-4725.2009.01325.x

13. Lichter MD, Karagas MR, Mott LA, Spencer SK, Stukel TA, Greenberg ER. Therapeutic ionizing radiation and the incidence of basal cell carcinoma and squamous cell carcinoma. The New Hampshire Skin Cancer Study Group. *Arch Dermatol*. 2000;136(8):1007-1011. doi:10.1001/archderm.136.8.1007

14. Loveland-Jones CE, Wang F, Bankhead RR, Huang Y, Reilly KJ. Squamous cell carcinoma of the nipple following radiation therapy for ductal carcinoma in situ: a case report. *J Med Case Rep*. 2010;4:186. doi:10.1186/1752-1947-4-186

15. Barrutia L, Martínez-García G, Santamarina-Albertos A, et al. Differentiating pagetoid Bowen disease from Paget disease on the nipple-areola complex: Two unique, challenging cases. *J Cutan Pathol*. 2021;48(11):1416-1422. doi:10.1111/cup.14092

Medical School Faculty and Staff Well-being Post COVID-19 Pandemic Follow-up

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https://doi.org/10.62547/XTZQ3941

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Abstract

The authors performed a follow-up COVID pandemic era employee well-being survey in spring 2022 during the period of vaccine and antiviral therapy availability. The survey results for medical school employees were compared with the results of a pre-vaccine survey from fall of 2020 to assess employees' continued concerns. At the time of the follow-up survey, employee well-being programs and resources along with telework policies had been introduced. The survey findings reinforced the need to tailor such programs differently for staff members, given their different work context. Priority areas should include providing well-being programs during working hours, time-off for well-being or mental health needs, and attention to equity in access to the well-being and telework programs.

Introduction

The coronavirus disease 2019 (COVID-19) pandemic profoundly impacted medical education. Faculty and staff members had to adjust to changes in administrative policies and teaching. New technology and workplace processes were quickly implemented during the pandemic, which included online or remote meetings, modified teaching processes, and telework/remote work arrangements. As a community-based medical school with no attached university hospital, the John A. Burns School of Medicine (JABSOM) also had to incorporate and abide by policies and procedures aligning with affiliated hospitals and clinics. These mandated educational delivery and evaluation changes placed considerable stress on faculty and staff members.

The authors of this manuscript previously reported a survey of JABSOM faculty and staff members in the fall of 2020 to gauge individual stress and worries and how the medical school communicated and handled the necessary educational changes.[1] At that time, policies were in place requiring only essential workers to report to campus in person. Results of the 2020 survey showed that both faculty and staff members reported high concerns regarding the health risks and well-being of family, friends, and themselves as compared to other potential personal and work concerns. Staff members had significantly more worries than faculty members about their own health and well-being, ability to pay bills, and potential loss of their jobs.

By spring 2022, most courses were back in person, and telework policies had been implemented. Similar to universities across the world, the shift from remote work and teaching during the pandemic to a new post-pandemic in-person or hybrid environment required new standards and practices for administration, medical education curricula, and clinical practice, all of which appeared to add additional stress and worry to faculty and staff. To assess employees' continued concerns, a follow-up study to the initial survey was administered in spring 2022 during the period of vaccine and antiviral therapy availability, ongoing viral mutations, diagnostic and infection prevention advances, and related new policies.

Methods

Participants represented a convenience sample of JABSOM compensated teaching, research, and administrative faculty and staff members. Recruitment was conducted electronically by email, through general school announcements, and through presentations at faculty and staff meetings. Surveys were voluntary, self-administered, anonymous, and available via a website. No incentive was offered. Survey results from 2022 were compared with the original 2020 survey results. The fall 2020 surveys were open for 6 weeks, closing on October 31, 2020. The spring 2022 surveys were open for 8 weeks, closing on June 3, 2022. Faculty and staff member categories were self-identified according to their university appointment. University of Hawai'i (UH) Institutional Review Board approval was obtained (protocol number 2020-00284).

The Higher Education Data Sharing Consortium COVID-19 Institutional Response Staff and Faculty survey instruments (© 2020 Higher Education Data Sharing Consortium) were used to measure how the pandemic affected the employees' duties as faculty and staff members.[2] These surveys were created to help gauge faculty and staff member responses to COVID-19. For this analysis, questions on worry due to the pandemic (11 questions) were examined using 5-point Likert scales. Open-ended text response questions on what was appreciated at work, causes of stress/anxiety, and future worries and concerns are presented using a thematic analysis.

The Mann-Whitney U test (known also as the Wilcoxon rank sum test) was used to compare distribution differences in the independent responses of faculty (2022) versus staff (2022) members. The Wilcoxon signed-rank test (also known as the Wilcoxon matched pair test) was used to compare matched responses: faculty (2022) versus faculty (2020); and, correspondingly staff (2022) versus staff (2020). Participants from both survey iterations were recruited from the same medical school population. However, since surveys were anonymous, a post hoc matching of pairs was conducted to reduce statistical inhomogeneity. Pairs from 2022 and 2020 were matched based on demographic variables: full-time or part-time, primary work category, gender, and self-identified race(s).

The Bonferroni correction was applied to address type 1 error risk due to multiple comparisons, and an adjusted *P* value of ⩽.005 was considered significant. Statistical tests were 2-tailed, and data analysis was performed using IBM SPSS, version 28 (IBM Corp, Armonk, NY).

Results

In the spring 2022 survey, 57 faculty and 73 staff members participated in the survey. In the previous study's fall 2020 survey, 80 faculty members and 73 staff members participated.[1] In both groups (2022 and 2020, respectively), the majority were female (61%, 61%), over half the faculty and staff identified as Asian (51%, 55%), followed by White (23%, 19%), more than one race (16%, 17%), and Native Hawaiian or Pacific Islander (10%, 6%). For both groups, most respondents were full-time employees (77%, 84%). Participating faculty members' academic ranks were mostly in the (assistant, associate, or full) professor category (85%, 81%). See **Table 1** for the characteristics of survey participants.

Faculty (2022) Versus Staff (2022)

Comparing faculty versus staff respondents in 2022, the staff reported a higher level of worry than faculty members in all except for 3 questions: health and well-being of students, losing connections with colleagues, and doing jobs effectively despite changes. Statistically significant differences were detected in 3 worry questions: one's own health (*P*<.001), paying bills (*P*=.003), and losing connections with colleagues (*P*<.008). For the first 2 questions, staff members reported greater worry than faculty members, whereas faculty had greater worry levels for losing connections with colleagues than staff (see **Figure 1**).

Paired Differences - Faculty (2022) Versus Faculty (2020)

Post hoc matching of respondents resulted in 41 survey respondent pairs for faculty. Unmatched pairs were removed from analyses: 2022 (n=16), 2020 (n=39). In comparing the matched faculty members from 2022 (n=41) to 2020 (n=41), no statistical differences were detected in any of the analyzed responses to the worry questions. However, there was a general trend of less or similar worry felt in 2022 as compared to 2020, (see **Figure 2**).

Paired Differences - Staff (2022) Versus Staff (2020)

Post hoc matching of respondents resulted in 54 respondent pairs for staff members. Unmatched pairs were removed from analyses: 2022 (n=19), 2020 (n=19). Matched staff responses from 2022 (n=54) compared to 2020 (n=54) demonstrated a general trend of less worry felt in 2022 as compared to 2020, except for 1 question related to pressure to come to work. A significant difference in 1 worry question was detected: how often do you worry about the future of JABSOM (*P*<.001) (see **Figure 3**).

Open-ended Responses Related to Stress and Worry 2022 – Faculty and Staff

In response to the open-ended question in the 2022 survey, "What are your biggest worries or concerns (e.g., administrative, education, research) as you think about what's coming in the next few months?" the most common response theme for faculty members (16 responses) was concern related to the impact of COVID-19 on education and student learning. This included worries and concerns about changes in educational practices, teaching approaches, educational expectations, and support. The second most common concern for faculty members (13 responses) was the impact of COVID-19 on the workplace. Concerns included a balance of telework and in-person modalities, increased workload, and work-life balance.

The most common response theme for staff members in the 2022 survey (39 responses) was having worry and concern about returning to the workplace. Responses included returning to work in-person full-time and ending the telework option, increased possibility of COVID-19 exposure when returning to in-person activities, and the logistics of coordinating with those who continue to telework. The second most common theme was COVID-19 infection risk and the possibility of new variants (9 responses). Comments included concerns and worries regarding a potential rise in COVID-19 cases due to relaxed restrictions and the resurgence of the pandemic.

Discussion

This follow-up study reexamined well-being among medical school faculty and staff members approximately 2 years after the start of the COVID-19 pandemic. Consistent with the 2020 survey, faculty members generally had fewer worries compared to staff. This may relate in part to differences in the roles of faculty members versus staff. Faculty members at a medical school may have greater knowledge on health and virology as compared to staff, and may have fewer financial worries and job insecurity due to generally higher salaries and dual roles as faculty members and clinicians. For the open-ended question, both faculty and staff groups shifted from worries on financial and economic concerns in 2020, to concerns related to workflow and workplace activities and expectations in 2022. It is likely that a growing understanding of COVID-19, the availability of vaccines and effective antiviral treatments, which ended lockdowns and restrictions, and the reopening of businesses and services helped mediate individual's job insecurity and financial concerns. Despite better workplace communication, accommodations, and other job-related support at the medical school, worries may have shifted to job requirements and expectations post-pandemic.

To proactively address stress and well-being among JABSOM employees, several initiatives described below were established and have been institutionalized since the start of the pandemic, as part of the overall JABSOM strategic plan. A mindful practice program was initially established for faculty in February 2019, but later expanded in March 2020 to include all JABSOM faculty, staff, and students.

Table 1. Characteristics of JABSOM Well-being Survey Respondents, Fall 2020 and Spring 2022

	2020			2022		
	Faculty (n=57)	Staff (n=73)	Total (n=130)	Faculty (n=80)	Staff (n=73)	Total (n=153)
	Gender,					
Male	26 (45)	22 (30)	48 (37)	37 (46)	22 (30)	59 (39)
Female	30 (52)	49 (67)	79 (61)	43 (54)	50 (69)	93 (61)
Non-binary[a]	1 (2)	2 (3)	3 (2)	0	1 (1)	1 (1)
	Race identified, n (%)					
American Indian or Alaska Native	0	0	0	1 (1)	0	1 (1)
Asian	23 (40)	49 (67)	72 (55)	35 (44)	43 (59)	78 (51)
Native Hawaiian or Pacific Islander	2 (4)	6 (8)	8 (6)	8 (10)	7 (10)	15 (10)
White	18 (32)	7 (10)	25 (19)	23 (29)	12 (1)	35 (23)
Hispanic or Latino	2 (4)	1 (1)	3 (2)	0	0	0
More than one race	12 (21)	10 (14)	22 (17)	13 (16)	11 (15)	24 (16)
	Employment, n (%)					
Part-time	16 (28)	5 (7)	21 (16)	28 (35)	7 (9)	35 (23)
Full-time	41 (72)	68 (93)	109 (84)	52 (65)	66 (90)	118 (77)
	Academic Rank (faculty only), n (%)					
Professor	19 (32)		19 (32)	24 (30)		24 (30)
Associate Professor	12 (21)		12 (21)	19 (24)		19 (24)
Assistant Professor	15 (26)		15 (26)	25 (31)		25 (31)
Researcher	0		0	3 (4)		3 (4)
Specialist	7 (12)		7 (12)	5 (6)		5 (6)
Instructor	4 (7)		4 (7)	4 (5)		4 (5)
	Employment Category (staff only), n (%)					
Hourly (non-exempt) without responsibility for supervising staff		11 (15)	11 (15)		13 (18)	13 (18)
Hourly (non-exempt) with responsibility for supervising staff		4 (5)	4 (5)		1 (1)	1 (1)
Salaried (exempt) without responsibility for supervising staff		36 (49)	36 (49)		43 (59)	43 (59)
Salaried (exempt) with responsibility for supervising staff		22 (30)	22 (30)		16 (22)	16 (22)

[a] Non-binary refers to the self-reported sexual identity of the survey respondent.

This program offers monthly mindful webinar sessions to create resilience and meaningfulness at work to prevent burnout and improve work quality and interactions with colleagues, students, and potentially patients. The mindful practice sessions occur as monthly 30-minute lunchtime webinars on various topics that have included the following titles: Coping with Change and Uncertainty; Defeating Distractions, Mindful Priorities; Just Let It Go; Self-care – How to Practice it Without Feeling Selfish; Accentuating the Positive During Challenging Times; Freedom Through Forgiveness; and Mindfulness Amidst Global Conflict.

Another post-pandemic JABSOM initiative included the hiring of a Well-being and Resiliency Director, and the development of a school-wide committee: Well-being Enhancement and Resiliency Committee (WERC). The WERC is designed to assist the dean in fostering the development and sustainability of resilience and well-being for the JABSOM community. This includes planning and promoting well-being opportunities and resources, identifying barriers, and promoting a culture of well-being at the school. In 2024, the WERC conducted in-person and virtual "talk story" sessions that resulted in 17 school-wide recommendation priorities on well-being and resiliency. Recommendation topics are categorized in the following topic themes: *cultural humility*- curiosity and respect for values and experiences of self and others; *connection* - human need to be-

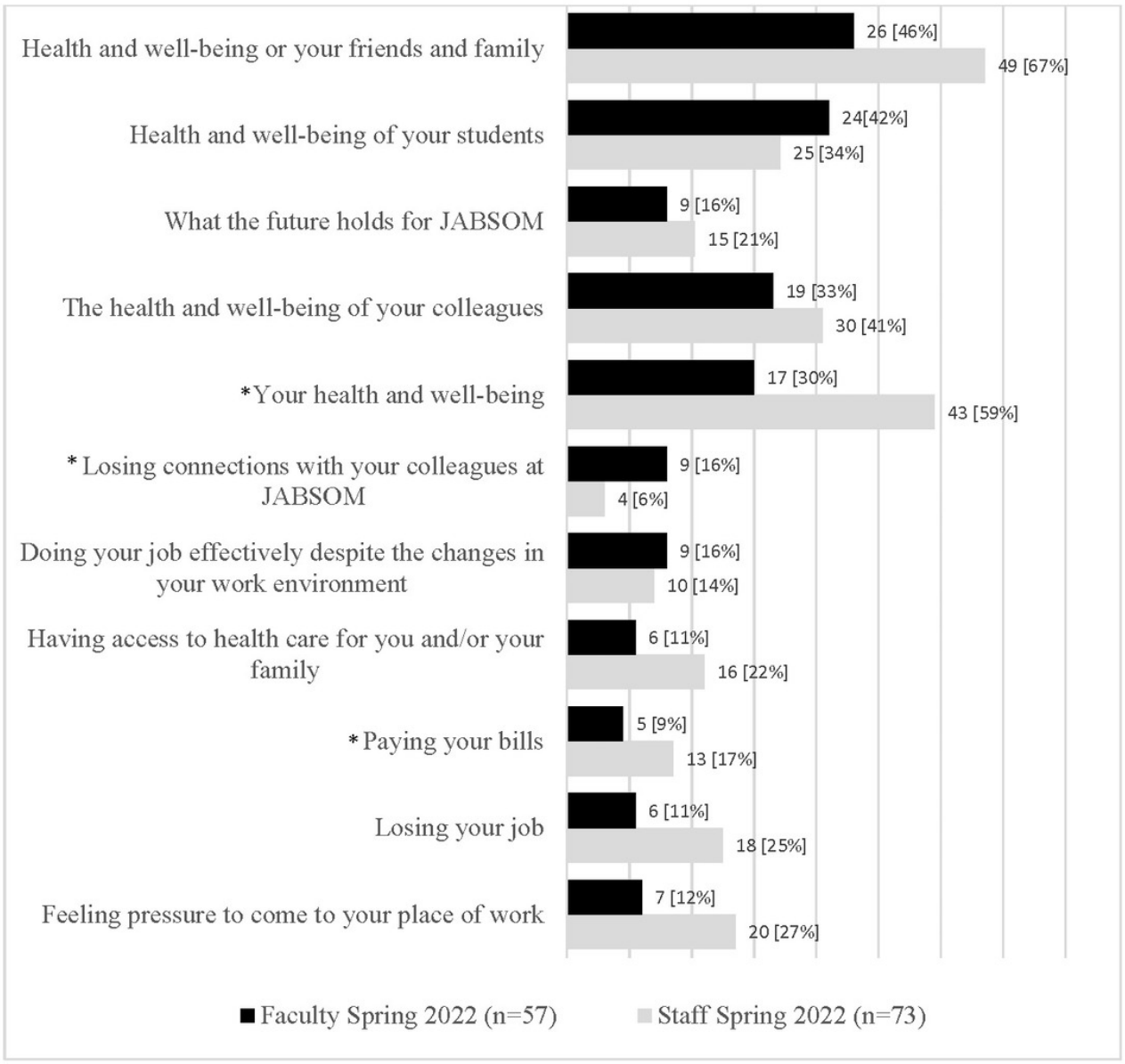

Figure 1. Faculty (2022) and Staff (2022) Comparison Reporting *Often* or *Very Often* for Questions on Worry Due to the Coronavirus Disease 2019 Pandemic

*Bonferroni correction was applied for an adjusted significance level P value of <.005

long and feel included and valued; *aloha spirit* - establishing a welcoming environment of diversity and inclusion; *clarity purpose structure*; *leadership and care and compassion*- caring for ourselves and each other; and *professional fulfillment* - finding joy and meaningfulness in learning and work. For more information visit the WERC webpage on the JABSOM website.[3]

Well-being and resiliency efforts have been long-standing and institutionalized in graduate medical education. In the 2015-2016 academic year, in order to address resident well-being, a Resident Well-Being subcommittee of the JABSOM Graduate Medical Education Committee (GMEC) was established. Due to the pandemic, in 2020 this committee evolved to include faculty and hospital administrators and was renamed the GMEC Well-Being Subcommittee. Impetus for this change was to support the faculty well-being as they are expected to be role models for clinical care teams. Goals are defined by the current committee charge: "To create a culture that is engaging and supportive of resident and faculty well-being by implementing evidence-based wellness programs guided by feedback and outcomes. To create learning environments of mutual respect where all find fulfillment, meaning, and embrace positive challenges at work (GMEC Well-Being Subcommittee, updated July 2023)." The subcommittee is responsible for developing, prioritizing, and operationalizing action plan items to advance this culture, including acting as a liaison in building partnerships such as those with Hawai'i Residency Program and affiliated health systems.

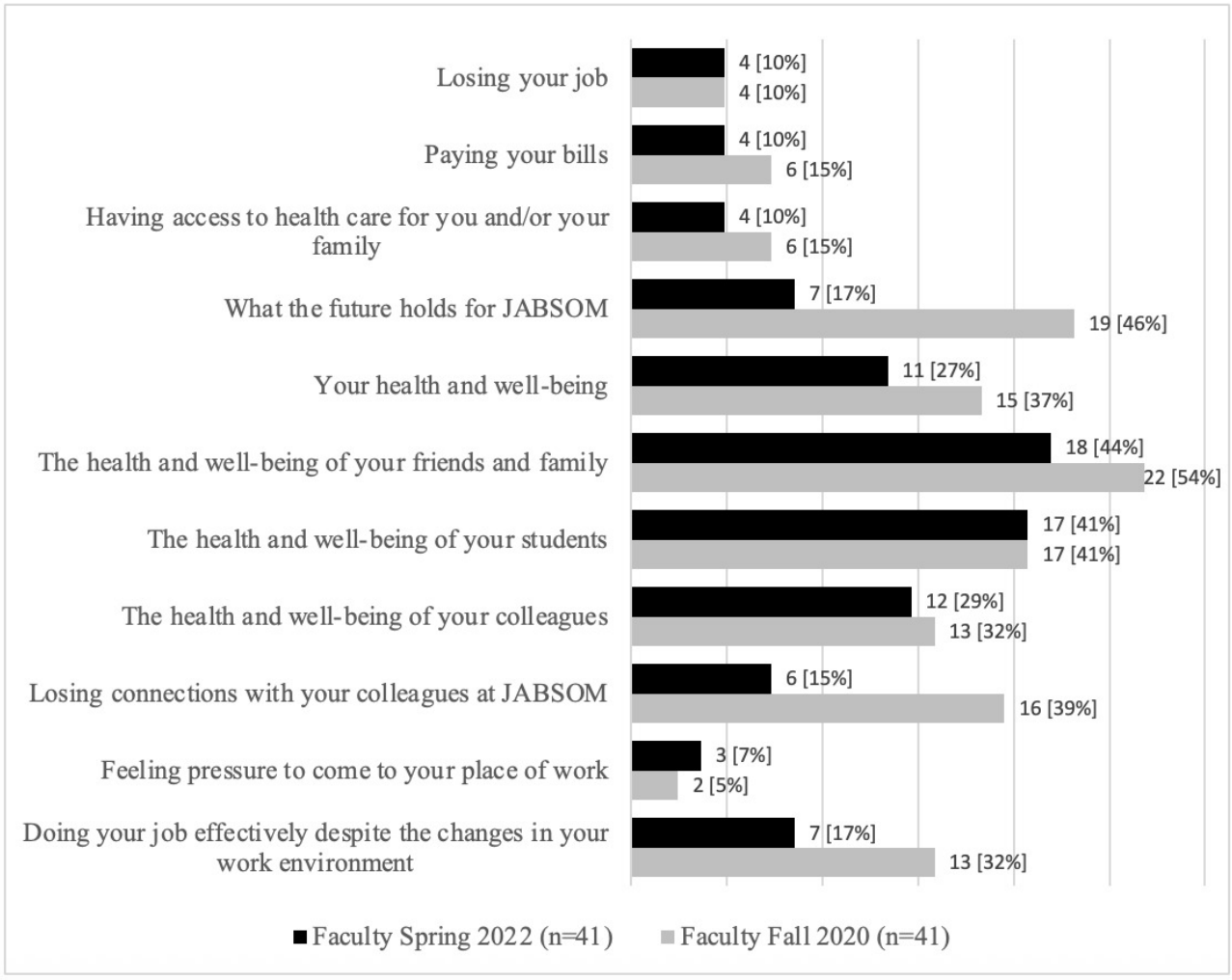

Figure 2. Faculty (2022) and Faculty (2020) Comparison Reporting *Often* or *Very Often* for Questions on Worry Due to the Coronavirus Disease 2019 Pandemic

Limitations

Data for this study were limited to one medical school, which limits generalizability. Limitations also include a small sample size, and the post hoc matching of group pairs may have introduced errors in analysis. Additionally, since the surveys were self-administered online, there may be selection bias since those with little operational or wellness concerns may not view the survey as a priority to complete. The recruitment process may have also excluded those who do not regularly check their university email or are unable to attend faculty and staff meetings. Although these data are from a single medical school, they help further expand our knowledge of organizational stress and worries caused by the COVID-19 pandemic.

Conclusion

Findings from this study inform the evolution of JABSOM well-being programs and resources, particularly for staff members, whose work context differs from faculty. Priority areas include funding or time to participate in well-being programs during working hours, time-off for well-being or mental health needs, and attention to equity in access to well-being programs. In developing these strategies and policies, input and shared experiences from faculty and staff members can also be beneficial in determining strengths, weaknesses, and appropriateness of the different work and teaching modalities to reduce stress and worry, and support productivity. Future studies are needed to assess the impact of well-being programs on the mental health of university employees and how they affect teaching and educational outcomes.

Submitted: January 24, 2024 PDT. Accepted: July 26, 2025 PDT. Published: August 01, 2025 PDT.

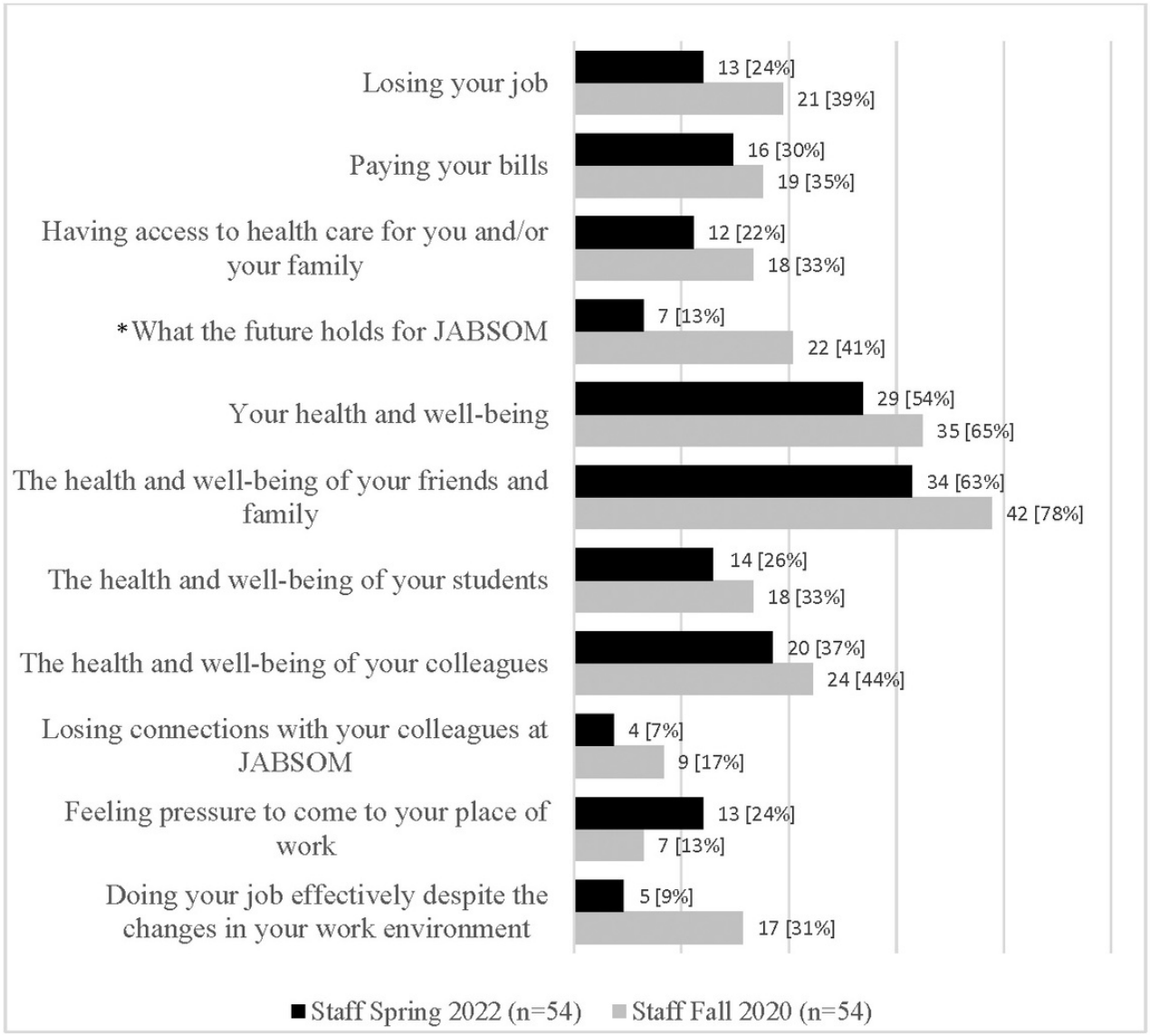

Figure 3. Staff (2022) and Staff (2020) Comparison Reporting *Often* or *Very Often* for Questions on Worry Due to the Coronavirus Disease 2019 Pandemic

* Bonferroni correction was applied for an adjusted significance level P value of <.005

References

1. Connolly KK, Buenconsejo-Lum LE, Hedges JR. Medical school faculty and staff well-being in fall 2020 during the COVID-19 pandemic. *Hawaii J Health Soc Welf*. 2022;81(11):295-301.

2. COVID-19 Response Surveys – Spring 2020. Higher Education Data Sharing Consortium. Accessed January 3, 2024. https://www.hedsconsortium.org/covid-19-institutional-response-surveys/

3. Wellbeing Enhancement & Resiliency Committee (WERC). John A. Burns School of Medicine Website. Accessed April 4, 2025. https://jabsom.hawaii.edu/about/leadership/wellbeing-enhancement-and-resiliency-committee-werc/index.html

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.

Revised 3/21/23

Hawai‘i Journal of Health & Social Welfare
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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