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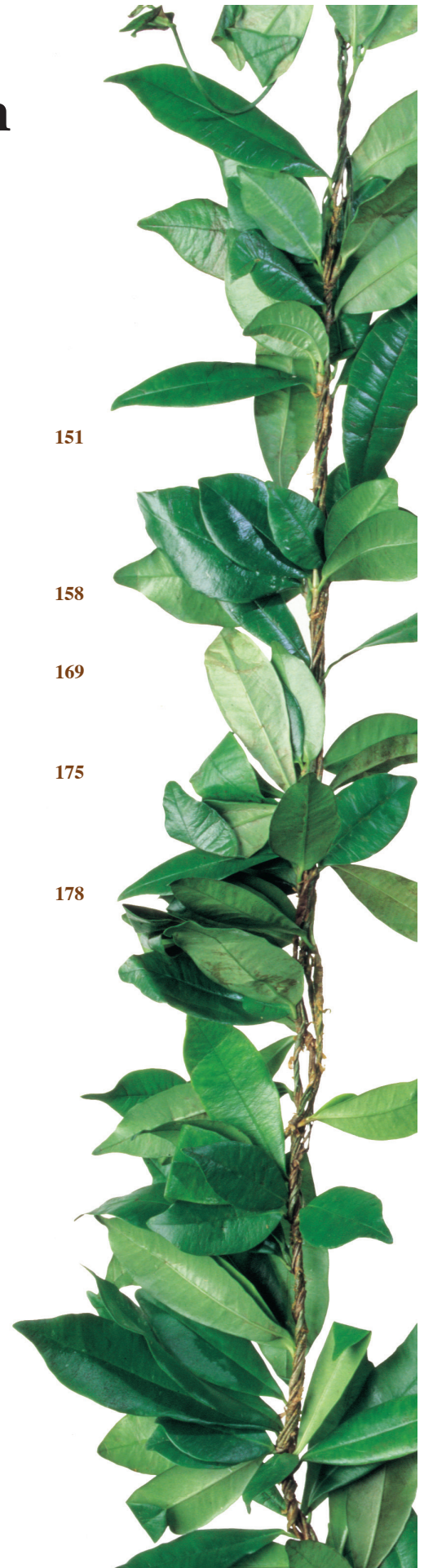
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# Hawai'i Journal of Health & Social Welfare

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# A Systematic Literature Review of Asian American, Native Hawaiian, and Pacific Islander Youth Electronic Nicotine Delivery Systems (ENDS) Use

Kelsey S. Manglallan MSW; Dixie L. Johnson MSW; Mistie Hokulani Rosario MPH; Katlyn J. An BS; Adabelle B. Carson BS; Kristina T. Phillips PhD; Pallav Pokhrel PhD; Scott K. Okamoto PhD

## Abstract

*Rates of electronic nicotine delivery systems (ENDS) use are exponentially increasing in youth and young adults within the United States, including Asian American, Native Hawaiian, and Pacific Islander (AANHPI) youth in Hawai'i. Disproportionately high ENDS use rates for AANHPI youth point to the need to understand the empirical literature in this area. A systematic literature review is a prerequisite for programs effectively curbing AANHPI youths' elevated use of ENDS. This systematic literature review examines empirical studies published between 2010-2020 on ENDS and their use as it applies to AANHPI youth. A total of 11 articles were identified using specific inclusionary and exclusionary criteria in a literature search. Studies described individual and interpersonal correlates to ENDS use. Notably, there were no published ENDS intervention studies detailed to AANHPI youth. Implications of these studies for prevention and social welfare interventions are discussed.*

## Keywords

vaping, electronic nicotine delivery systems, e-cigarettes, smoking, youth

## Abbreviations and Acronyms

AA = Asian American  
AANHPI = Asian American, Native Hawaiian, and Pacific Islander  
CBD = cannabidiol  
CC = combustible cigarettes  
ENDS = electronic nicotine delivery systems  
NH = Native Hawaiian  
PI = Pacific Islander  
THC = tetrahydrocannabinol

## Introduction

Electronic nicotine delivery systems (ENDS) products can be considered an entry nicotine product for youth that may lead to future use of more harmful tobacco products. ENDS use is considered a risk factor for future combustible cigarette (CC) use<sup>1-4</sup> and other substances (eg, marijuana, cocaine).<sup>5,6</sup> Over the past decade, youth use of ENDS has grown exponentially. Compared with other tobacco products, which have shown relatively unchanged or decreasing trajectories of use over the past decade, youth e-cigarette use has rapidly accelerated,<sup>7</sup> particularly for Asian Americans (AAs), Native Hawaiians (NHs), and Pacific Islanders (PIs).<sup>8</sup> These disproportionate rates point to the emerging need for health practitioners to address ENDS use within schools due to increased exposure from peers and

communities with large Asian American, Native Hawaiian, and Pacific Islander (AANHPI) populations.<sup>8</sup>

Therefore, this study aims to systematically review the published scientific literature related to ENDS use within AANHPI adolescent and young adult populations. It is necessary to understand this existing literature to identify research gaps and guide the development of relevant prevention and cessation programs. This study used a set of inclusionary and exclusionary criteria to identify relevant studies focused on the determinants of ENDS use and ENDS-use interventions for AANHPI youth and young adults. As a new generation of smokers emerges and significant health implications associated with them, healthcare providers must be aware of ENDS use correlates to provide relevant interventions.

## Definition and History of Youth ENDS Use

ENDS are non-combustible tobacco products that include a diverse group of reusable or disposable devices that use an “e-liquid”. E-liquids can contain nicotine, tetrahydrocannabinol (THC), cannabidiol (CBD), flavoring, and other chemicals that are converted to an aerosol through pod or mod systems.<sup>7,9-11</sup> These products come in scents and flavors, such as lychee, taro, and passion fruit, that target and are attractive to AANHPI preferences.

Studies from the early 2000s found tobacco use to be a substantial problem in many AANHPI populations.<sup>12</sup> In 2000, one-third of AA high school seniors were smokers, and more than 25% of female PI middle school youth had smoked within the past month.<sup>12,13</sup> After 2000, health researchers began focusing on tobacco use prevalence, though these efforts predated the introduction of ENDS.<sup>10,12,14</sup> The surge of ENDS use in the US around 2011 brought forth national ENDS surveillance efforts; however, ENDS research targeting AANHPI populations remained limited. This disparity is a significant problem since AANHPI populations represent one of the fastest-growing demographics (5.6% nationally and 14.9% in California) yet they are underrepresented in health and tobacco use research.<sup>15</sup> Due to these gaps in the literature, it is crucial to understand and identify correlates associated with ENDS use onset to aid in establishing culturally competent programs.

In addition to well-known tobacco-linked health issues (eg, lung cancer, lipoid pneumonia, asthma), the rise in ENDS products has introduced new nicotine-related lung injuries and illnesses, such as bronchiolitis obliterans (reported in 18.8% of adolescent ENDS users), primary spontaneous pneumothorax, injuries due to exploding vape pens, and e-cigarette or vaping product use-associated lung injury (EVALI).<sup>7,9,16,17</sup> King et al reported 2602 EVALI cases across the US and 57 confirmed deaths.<sup>7</sup> The median age of patients diagnosed with EVALI was 24 years, and 62% of patients were 18-34 years old.<sup>7</sup> Not only are the effects of long-term ENDS use unclear, but recent studies have shown that ENDS use is associated with severe respiratory disorders, such as COVID-19 and asthma.<sup>18-20</sup> There is also evidence that ENDS use onset alters youth brain reward systems, leading to a higher likelihood of future tobacco and other drug use.<sup>5,15,21-23</sup>

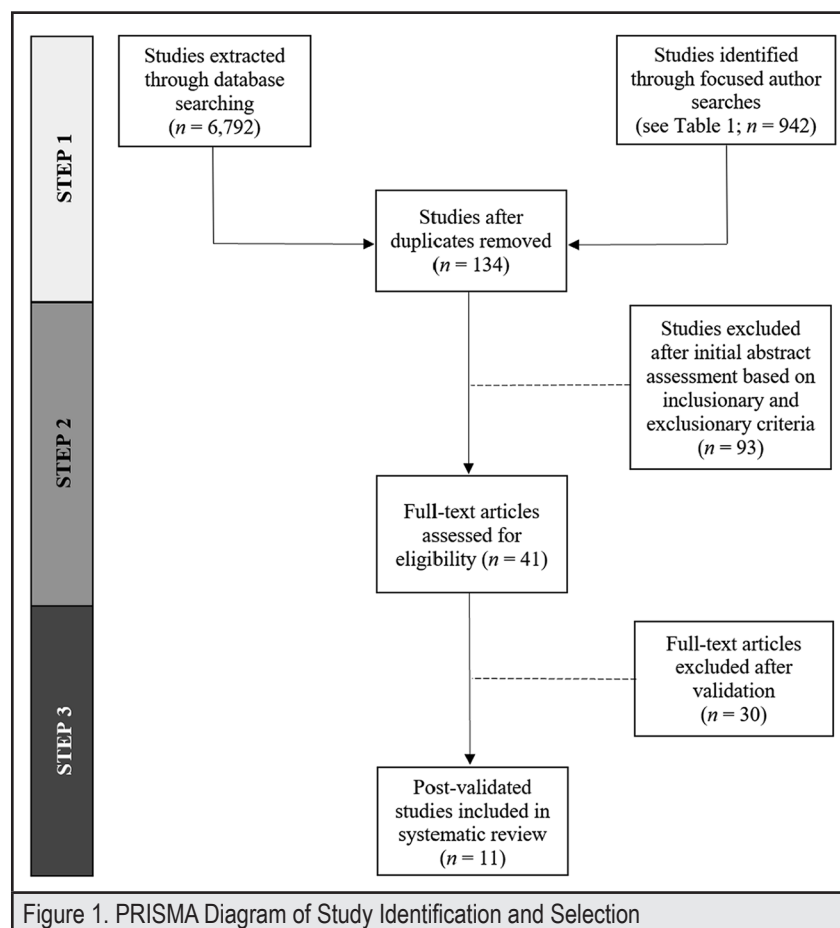
Recent surveillance data indicates the need to understand AANHPI youth use of ENDS. For example, 30.6% of all middle school youth in Hawai'i reported lifetime use of an ENDS product, ranking first nationally among all states collecting middle school data.<sup>10</sup> Of these youth, 45.4% were NH or other Pacific Islanders (OPI), and 24.2% were Asian, representing the highest ENDS use among major ethnic groups in Hawai'i.

When assessed as a single group, AANHPI youth expressed higher usage rates than all other racial/ethnic groups.<sup>24</sup> However, AANHPI subgroups have differing reasons for ENDS smoking onset and prolonged usage, such as the availability of e-liquid flavors targeted towards Asian cultures, nicotine highs, and as a quit-aid for CCs.<sup>24,25</sup>

A current understanding of ENDS use patterns in AANHPI youth populations will lead to more effective, culturally relevant intervention programs for these youth. Thus, this study aims to examine the literature related to ENDS use within AANHPI youth and young adult populations residing in the US and the US-Affiliated Pacific Islands (USAPI). Using established procedures for systematic literature reviews (ie, Preferred Reporting Items for Systematic Reviews and Meta-Analyses, or PRISMA<sup>26</sup>; see **Figure 1**), this peer-reviewed literature review focuses on the correlates of ENDS use, interventions to reduce its use, and implications for AANHPI communities.

## Method

**Figure 1** illustrates the literature search and review process for identifying articles for this review. In Step 1, a systematic search was conducted using 2 primary methods: (1) a computerized



database search using keywords, and (2) a focused author search. For the computerized database search, the databases that were included were PubMed, PsycNet (which includes PsycArticles and PsycInfo), and a focused author search through Hawai'i Pacific University's search engine, which pulls from a multitude of databases. All databases used were searched using key terms; "smoking", "e-cigarette", "Pacific Islander", "Asian American", "youth", and "young adult". The term "smoking" was used in the primary search, due to its broad inclusion of studies with both CCs and ENDS. Additionally, the articles were filtered to include publication dates from 2010-2020, which coincides with the national increase in ENDS usage among youth. To expand the search perimeter, smoking and e-cigarette derivatives were included as search terms (eg, "ENDS", "vaping", "vape"). For the focused author search, the names of 15 known AANHPI tobacco researchers were used: Kevin Cassel, Trenette Clark, Richard Hofstette, Jimi Huh, Seo-Ryung Kim, Adam Leventhal, Annette Maxwell, Sung See Moon, Pallav Pokhrel, Christopher Rogers, Andrew Subica, Sora Park Tanjasiri, Jennifer Unger, Thomas Wills, and Shu-Hong Zhu. This list was derived in collaboration with 3 senior co-authors who were established, federally funded tobacco and e-cigarette researchers.

After overlapping articles from the database searches were eliminated, in Step 2, the remaining articles were reviewed and evaluated based on the inclusionary and exclusionary criteria for this study. Articles were included in this review if the following criteria were met: (1) at least 50% of the study sample included AAs and/or PIs residing in the US or US territories (eg, Guam); (2) the study participants were between the ages of 12-29 years and/or had a mean age under 29 years; (3) the article exclusively focused on ENDS products, correlates to their use, (eg, social context, such as peer influences), and/or interventions; and (4) the article was a data-based empirical study published between 2010 and 2020. Articles were *excluded* from this review if: (1) the article focused on ENDS use with other substances but did not individually examine ENDS-use correlates; (2) the article was non-empirical (eg, descriptive or theoretical); or (3) the article was not peer-reviewed. This assessment excluded 93 articles, reducing the possible inclusions to 41 articles. In Step 3, the 3 primary authors screened the full text of the remaining 41 articles using the inclusionary and exclusionary criteria stated above.

## Results

The online database search yielded 6792 articles, and the focused author search yielded 942 articles. Once overlapping articles from the database searches were eliminated, 134 articles remained. After the inclusionary and exclusionary criteria review process, it reduced the final number of articles to a total of 11 empirical articles meeting the criteria (see **Table 1**), 2 of which were from California, 1 from California and Arkansas, and 8 from Hawai'i. The 11 studies included in this systematic review focused on individual-level and interpersonal correlates

of ENDS use among AANHPI youth. Five of the 11 studies included in this literature review had mean ages in the early to mid-20s, while the remaining 3 had samples with mean ages of approximately 15 years. None of the identified studies focused on AANHPI ENDS use interventions.

### Individual-Level Correlates to AANHPI Youths' ENDS Use

**Table 1** illustrates 11 categories related to individual-level correlates to ENDS use identified for AANHPI youth and young adults using a thematic analysis of the study findings from the 11 studies. These categories included ENDS: (1) for smoking cessation and reduction, (2) for health improvement, (3) for sensory satisfaction, (4) for self-regulation, (5) convenience for indoor "smoking", (6) the benefit of discreet "smoking", (7) professional benefits recreational use, (8) social enhancement, (9) a cleaner "smoking" alternative, (10) ability to control nicotine intake, and (11) cost-effectiveness.<sup>18</sup>

An example of the health improvement and cleaner "smoking" alternative categories included that ENDS provided a healthier alternative to CCs without harmful secondhand smoke while improving physical fitness and sense of taste and smell.<sup>18</sup> Assumptions were made that ENDS did not pose a safety risk due to not resulting in the same health issues as CCs, which led to adverse health complications. Examples of the category of sensory satisfaction included getting a better "buzz" than CCs and having multiple flavors to choose from with pleasant scents and enjoyable flavors/tastes.<sup>18</sup> AA participants discussed the intersections of their culture that accounted for their ENDS use, which fall under the category of social enhancement. An example of this theme includes the familiar flavors tied to Asian foods and products that ENDS contains.<sup>25</sup> An example of the category discreet "smoking" is that ENDS are seen as convenient due to their availability and accessibility compared to CCs.<sup>27</sup> For example, activities such as riding in vehicles and being indoors accounted for increased ENDS use when CCs were not permitted for use.<sup>27</sup>

### Interpersonal Correlates to AANHPI Youths' ENDS Use

Six studies examining ENDS-related correlates in adolescents and young adults focus on interpersonal and social factors, primarily those related to peer and family influences. One study found that 73% of AANHPI adolescents learned about ENDS from peers, and 19% reported learning through the family.<sup>24</sup> Three studies found individuals' attitudes towards ENDS as a means to enhance their social interactions.<sup>1,18,24</sup> For example, AANHPI adolescents and young adults reportedly perceived ENDS as a more socially acceptable alternative to traditional CCs and even as 'fashionable' among their peers.<sup>18</sup> Due to the ability to use ENDS discreetly, AANHPIs reported ENDS as a more convenient and accessible method to smoke without getting caught by authorities.<sup>18,25</sup> Further, Pokhrel et al.<sup>27</sup> found

**Table 1. Studies Included in the Systematic Literature Review of Electronic Nicotine Delivery Systems Among AANHPI Youth**

Study	Age Range (M age)	Race/Ethnicity	Study Design (N)	ENDS Type(s)	Correlate(s)	Description	Major Finding(s)
Maglalang et al. (2016)	18-25 (21.0)	FIL, CHI, VIE, MAAPI, OAAPI	QUAN (501)	VP, EH	Awareness of ENDS from various sources, perceived ENDS harm, demographics, flavors	Study explored associations between ENDS use and awareness and perceived risks	ENDS use was associated with awareness of ENDS through peers, low perceived risk, and particular ethnic backgrounds.
Maglalang et al. (2019)	19-34 (25)	CHI, FIL, THA, VIE, MAR	QUAL (12)	E-CIG	Perceived ENDS harm, cultural, familial, and peer acceptance	Study examined ENDS usage, health perception, and culture	Five major themes emerged: perceived health benefits, perceived as less harmful, de-stigmatization among family and peers, variety of options and familiarity with e-juice flavors, and popularity of cloud-chasing.
Pokhrel et al. (2014)	18-40 (23.5)	AA, AFA, FIL, HIS, NHPI, WHI	QUAN (307)	E-CIG	Outcome expectancies, race/ethnicity, age	Examined participant characteristics, and E-CIG susceptibility, outcome expectancies, and use	Current and past 30-day CC smoking was positively associated with positive expectancies while inverse relationships were found with negative expectancies. Older age and Filipino background were associated with E-CIG use.
Pokhrel, ... Fagen (2015)	18-35 (25.1)	AA, AFA, FIL, HIS, NHPI, WHI	QUAL (62)	E-CIG	Reasons for liking and not liking E-CIGs	Explored the reasons ENDS users liked and disliked E-CIGs	Four major themes emerged: perceptions that E-CIGs are safer than CCs, benefits related to vaping, flavor advantages, and use for recreational purposes.
Pokhrel, ... Regmi, & Fagen (2015)	18-35 (25.1)	AA, AFA, FIL, HIS, NHPI, WHI	QUAL (62)	E-CIG, CC	Contexts when CCs and E-CIGs are used	Explored the contexts surrounding CC and E-CIG use in dual users	CCs and E-CIGs were used during select activities (eg, before/after a meal). CCs were used for craving or stimulation, in certain locations (eg, being outdoors), and with other substances. E-CIGs were used when CCs were unavailable or unable to be used.
Subica et al. (2020)	18-30 (23.6)	SAM, MAR	QUAN (143)	E-CIG, CC	Outcome expectancies, gender, race/ethnicity	Explored risk factors associated with E-CIG use	Positive outcome, but not negative, expectancies, were associated with current E-CIG use. Men were more likely to report CC use and SAMs were more likely to report ever using E-CIGs and reported higher positive and negative expectancies.
Schweitzer et al. (2017)	N/A (15.8)	AI, AN, AFA, FIL, NH, OPI, JAP, OA, WHI	QUAN (6089)	E-CIG, CC, MJ	E-CIG use, age, gender, ethnicity, weight (body mass index)	Examined the relationship between E-CIG use and asthma	Those who reported having asthma (ever or current) was associated significantly with E-CIG, CC, and MJ use.
Wills et al. (2015)	N/A (14.6)	CHI, JAP, KA, FIL, WHI, NH, SAM, TONG, AFA, HIS	QUAN (1941)	E-CIG, CC	Psychosocial risk and protective variables (eg, parental support, peer smoking, sensation seeking)	Examined E-CIG and CC use to determine risk factors for discriminate user categories	Dual users (17% of sample) and CC users (12%) had the highest risk status (elevated on risk factors and lower on protective factors). E-CIG users were higher on risk status than nonusers but lower than dual users. E-cigarette and dual users perceived E-CIGs as healthier than CCs compared to non-users.
Wills, Sargent, Gibbons, et al. (2016)	N/A (14.7)	CHI, JAP, KA, FIL, NH, OPI, WHI, OTH	QUAN (1136)	E-CIG, CC	E-CIG use, rebelliousness, parental support, and willingness to smoke, ethnicity	Studied whether E-CIG use onset differs for youth who are at low- vs. high-risk of smoking	Findings suggested that E-CIG use was a risk factor for future CC use among those who had never smoked previously. WHI populations, FILs, NHs, and those from other backgrounds were more likely to begin smoking than AA's.
Wills, Sargent, Knight, et al. (2016)	N/A (14.7)	CHI, JAP, KA, FIL, NH, OPI, WHI, OTH	QUAN (2309)	E-CIG, CC	Age, ethnicity, parent support/ monitoring, parent-adolescent conflict, rebelliousness, willingness to use CC, smoking expectancies, peer smoking	Examined the relationship between E-CIG use, willingness to smoke CCs, and social-cognitive factors that predict smoking CCs	Those who had used E-CIGs had a greater willingness to use CCs. This relation was partly mediated through positive expectancies about smoking. Parent-adolescent conflict and parental monitoring also predicted willingness to smoke CC. Willingness was associated with future CC onset.
Wills et al. (2017)	14-16 (14.7)	CHI, JAP, KA, FIL, NH, OPI, WHI, OTH	QUAN (2338)	E-CIG, CC	CC smoking onset, gender, ethnicity, age, rebelliousness, sensation seeking, parental support and monitoring, parental education	Examined relationship between E-CIG use and future CC smoking, as well as predictors of future E-CIG uptake	E-CIG use was a risk factor for future CC use. WHI populations and NHs were at higher risk for E-CIG uptake.

**Table 1.** Note: Race/Ethnicity: AA=Asian American, AI=American Indian, AN=Alaskan Native, AFA=African American, PI=Pacific Islander, AFA=African American, WHI=White, HIS=Hispanic, KA=Korean American, FIL=Filipino, CHI=Chinese, VIE=Vietnamese, THA=Thai, JAP=Japanese, CHU=Chuukese, SAM=Samoan, TONG=Tongan, MAR=Marshallese, NH=Native Hawaiian, NHPI=Native Hawaiian/Pacific Islander, NH=Native Hawaiian, MAAPI=Mixed Asian American Pacific Islander, OAAPI=Other Asian American Pacific Islander, OA=Other Asian, OPI=Other Pacific Islander, MPI=Mixed Pacific Islander, MR=Mixed Race, OTH=Other.  
Study Design: QUAL=Qualitative, QUAN=Quantitative  
Tobacco Type: E-CIG=Electronic Cigarette, CC=Combustible Cigarette, VP=Vape pen, EH=E-hookah, MJ=Marijuana  
Other: N/A=not available

AANHPI dual users (ENDS and CCs) reported higher ENDS usage over CCs because the odor from ENDS is viewed more positively than that of CCs in both social and professional settings and because of the belief that there is a decreased risk for second-hand smoke exposure with ENDS. These characteristics were also reasons AANHPI ENDS users used to smoke indoors or in more confined spaces.

## Discussion

This study systematically reviewed the empirical literature focused on AANHPI ENDS use. The findings indicate that multiple individual-level and interpersonal factors affect AANHPI youth and young adult ENDS use. In particular, interpersonal factors highlight how ENDS use is influenced by significant relationships for AANHPI youth and young adults. Additional studies also examined ENDS onset for low-risk AANHPI youth and found ENDS as a gateway towards CC use for adolescents who would otherwise have been considered low-risk.<sup>1,2,28</sup>

Regarding youth ENDS interventions, the Substance Abuse and Mental Health Services Administration<sup>29</sup> described 6 universal ENDS-focused prevention interventions for youth that were exclusively educational.<sup>29</sup> However, these studies focused on something other than school or community-based ENDS interventions for AANHPI youth. Based on the current programs available and the emphasis placed on family and community within AANHPI groups, balanced, multi-level interventions targeting different ecosystemic levels (eg, the Social-Ecological model consisting of the individual, family, and community levels) is a promising approach to reduce ENDS use among AANHPI youth and young adult populations. Based on the interpersonal correlates described in this study's findings, these interventions should also reflect the relational context for AANHPI youth, including offers to use ENDS from family and peer influences. There is a disparity in ENDS research targeting AANHPI populations and a substantial gap in substance use and tobacco interventions for these groups. A recent systematic literature review found only 2 tobacco prevention interventions for NHPI youth published between 2010-2020, neither of which included ENDS use.<sup>30</sup> Studies of ENDS interventions have included AANHPI youth in their samples; however, due to the relatively small AANHPI sample sizes and lack of analysis specific to AANHPI culture when developing the interventions, it is unclear if these universal interventions will be effective in curbing ENDS use for AANHPI youth populations.<sup>31,32</sup>

PI youth, not including NH youth, are still one of the most under-represented groups in empirical studies examining ENDS use. Of the ENDS studies that included PI youth in their samples, the number of participants were often so low that researchers were unable to draw definitive conclusions regarding youth ENDS and tobacco use. From the studies included in this review, 50% evaluated NHs separately from AAs. However, they also grouped specific PI populations with AAs or in the broader category of "other Pacific Islanders". Historically, researchers have combined AAs and PIs in their sample demographics and data analyses, obscuring rates of physical disorders and mental health issues.<sup>33</sup> Notably, AAs, PIs, and NHs all belong to distinct cultural groups that vary greatly in regards to their within-group cultural, linguistic, and socioeconomic differences, as well as their interaction with their environments.<sup>33</sup> Data and information specific to distinct AA, PI, and NH subgroups are necessary to guide the development of culturally relevant interventions for different AA, PI, and NH communities.

## Implications for Practice and Future Research

The primary purpose of this study was to systematically review the published scientific literature related to ENDS use within AANHPI adolescent and young adult populations. Additionally, this work provides insight into what has been published in the area and identifies correlates within the resulting literature. In the process of finding relevant articles on this subject, a significant gap in published works was discovered concerning research interventions for these groups. This study also points to the need for further research and culturally relevant, evidence-based interventions or prevention programs focused on ENDS use for AANHPI youth populations. Culturally relevant drug prevention programs for AANHPI youth that draw upon evidence-based principles and practices have shown significant effects on curbing alcohol, tobacco and other drug use.<sup>34,35</sup> However, not enough research has been conducted specifically on ENDS use across a broader cross-section of AANHPIs,<sup>36</sup> which may limit the ability to develop effective, culturally relevant ENDS interventions for AANHPI youth.

Understanding cultural and ethnic differences in correlates and determinants of ENDS use in AANHPI youth is an essential component to the development of successful interventions and culturally competent practice in a variety of settings (eg, schools, community agencies, policy settings, and case management). The findings from this study indicate the need for

further research in the field of prevention and the development of research-based methods to intervene successfully with ethnically diverse populations. Future research should also address ENDS use, ENDS determinants, and ENDS uses as an entry for other illicit substances.

Although there are large gaps in intervention research on AANHPI youth ENDS use, there are promising research projects in the very early stages of development and evaluation. For example, 1 project specifically targeting PI youth is funded through the National Cancer Institute. Entitled *Adolescent Tobacco and Areca Nut Use Prevention in Guam* (U54CA143727), this project (referred to as the Guam Study) aims to develop a culturally grounded, evidence-based CC, ENDS, and betel nut prevention program that can be utilized in schools across the USAPI.<sup>3</sup> Culturally grounded ENDS prevention focused on Marshallese and Chamorro youth populations in the Guam Study can be used to identify core prevention components that can be adapted to other PI subgroups and implemented by school social workers or psychologists in the Pacific region. Overall, more ENDS research is indicated for AANHPI youth populations, including studies using a multi-level approach to intervene at the individual, familial, and societal levels to address AANHPI youth ENDS use.

## Limitations

Findings were limited in this literature review to the most recent decade (2010-2020), to coincide with the emergence of youth ENDS use. This may have left out other relevant studies prior to 2010, articles in their early (pre-publication) stages, and any unpublished manuscripts. With the exception of 1 study, all took place in either California or Hawai‘i, which have the highest concentrations of AANHPIs. Generalizations of the findings with this population may not apply to other US regions. Many studies in this review combined AAs, PIs, and NHs in their study samples, which can be misleading due to the subgroup differences in culture, values, and beliefs. Finally, we employed a stringent criterion for inclusion of studies in our review (ie, study samples of 50% or more AANHPIs), in order to ensure that study findings were focused on and relevant to AANHPI youth. This criterion may have eliminated broader surveillance studies with secondary or supplemental findings relevant to AANHPI youth.

## Conclusions

Evidence concerning the association between ENDS use and individual or interpersonal correlates among AANHPI adolescents and young adults is growing, but still limited. Eleven empirical articles on a range of correlates to AANHPI ENDS use were identified in this systematic review. Of these 11 studies, social and familial influences were highly correlated with ENDS product use. ENDS use remains the most prevalent form of smoking in early adolescence in the US, including within

Hawai‘i,<sup>10</sup> and disproportionately impacts AANHPI communities.<sup>8,36</sup> Developing empirically informed ENDS interventions focused on AANHPI youth populations will address ENDS use disparities.

## Conflict of Interest

None of the authors identify a conflict of interest.

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## References

References marked with an asterisk indicate studies included in the systematic review

1. \*Wills TA, Knight R, Sargent JD, Gibbons FX, Pagano I, Williams RJ. Longitudinal study of e-cigarette use and onset of cigarette smoking among high school students in Hawaii. *Tob Control*. 2016;26(1):34-39. doi:10.1136/tobaccocontrol-2015-052705.
2. \*Wills TA, Sargent JD, Knight R, Pagano I, Gibbons FX. E-cigarette use and willingness to smoke: A sample of adolescent non-smokers. *Tob Control*. 2015;25(e1):e52-59. doi:10.1136/tobaccocontrol-2015-052349.
3. \*Wills TA, Sargent JD, Gibbons FX, Pagano I, Schweitzer R. E-cigarette use is differentially related to smoking onset among lower risk adolescents. *Tob Control*. 2016;26(5):534-539. doi:10.1136/tobaccocontrol-2016-053116.
4. \*Pokhrel P, Little MA, Fagan P, Muranaka N, Herzog TA. Electronic cigarette use outcome expectancies among college students. *Addict Behav*. 2014;39(6):1062-1065. doi:10.1016/j.addbeh.2014.02.014.
5. Pokhrel P, Fagan P, Kawamoto CT, Okamoto SK, Herzog TA. Predictors of marijuana vaping onset and escalation among young adults. *Drug Alcohol Depend*. 2020;216:108320. doi:10.1016/j.drugalcdep.2020.108320.
6. \*Subica AM, Guerrero E, Wu L-T, Aitaoto N, Iwamoto D, Moss HB. Electronic cigarette use and associated risk factors in U.S.-dwelling Pacific Islander young adults. *Subst Use Misuse*. 2020;55(10):1702-1708. doi:10.1080/10826084.2020.1756855.
7. King BA, Jones CM, Baldwin GT, Briss PA. The EVALI and youth vaping epidemics — implications for public health. *N Engl J Med*. 2020;382(8):689-691. doi:10.1056/nejmp1916171.
8. Wilson, AM, Unger, JA, Sorensen, G. E-cigarette use among Asian American, Native Hawaiian, and Pacific Islander youth in the United States. *J Adolesc Health*. 2019;67(3): 416-420. doi:10.1016/j.jadohealth.2019.07.019.
9. United States Food and Drug Administration. Tips to help avoid "vape" battery explosions. Accessed September 9, 2020. <https://www.fda.gov/tobacco-products/products-ingredients-components/tips-help-avoid-vape-battery-explosions>.
10. Center for Disease Control and Prevention. 1995-2019 Middle school youth risk behavior survey data Atlanta, GA: U.S. Department of Health & Human Services. Accessed September 9, 2020. <http://nccd.cdc.gov/youthonline/>.
11. U.S. Department of Health and Human Services. *E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General*. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. 2016. Accessed September 9, 2020. <https://www.ncbi.nlm.nih.gov/books/NBK538680/>
12. Lew R, Tanjasiri SP. Slowing the epidemic of tobacco use among Asian Americans and Pacific Islanders. *Am J Public Health*. 2003;93(5):764-768. doi:10.2105/ajph.93.5.764.
13. Appleyard J, Messeri P, Haviland ML. Smoking among Asian American and Hawaiian/Pacific Islander youth: Data from the 2000 national youth tobacco survey. *Asian Am Pac Isl J Health*. 2001;9(1):5-14.



14. Kim SS, Ziedonis D, Chen K. Tobacco use and dependence in Asian American and Pacific Islander adolescents: A review of the literature. *J Ethn Subst Abuse*. 2007;6(3):113-142. doi:10.1300/J233v06n03\_05
15. Romero DR, Pulvers K. Cigarette smoking among Asian American and Pacific Islander college students. *Health Promot Pract*. 2013;14(5 Suppl):61S-9S. doi:10.1177/1524839913482923.
16. Broderick SR. What does vaping do to your lungs? Johns Hopkins Medicine. 2021. Accessed September 9, 2020. <https://www.hopkinsmedicine.org/health/wellness-and-prevention/what-does-vaping-do-to-your-lungs>.
17. Galderisi A, Ferraro VA, Caserotti M, Quareni L, Perilongo G, Baraldi E. Protecting youth from the vaping epidemic. *Pediatr Allergy and Immunol*. 2020;31(S26):66-68. doi:10.1111/pai.13348.
18. Gaiha SM, Cheng J, Halpern-Felsher B. Association between youth smoking, electronic cigarette use, and COVID-19. *J Adolesc Health*. 2020;67(4):519-523. doi:10.1016/j.jadohealth.2020.07.002.
19. Wills TA, Pagano I, Williams RJ, Tam EK. E-cigarette use and respiratory disorder in an adult sample. *Drug Alcohol Depend*. 2019;194:363-370. doi:10.1016/j.drugalcdep.2018.10.004.
20. Schweitzer RJ, Wills TA, Tam E, Pagano I, Choi K. E-cigarette use and asthma in a multiethnic sample of adolescents. *Prev Med*. 2017;105:226-231. doi:10.1016/j.ypmed.2017.09.023.
21. Bhalerao A, Sivandzade F, Archie SR, Cucullo L. Public health policies on e-cigarettes. *Current Cardiology Reports*. 2019;21(10):111. doi:10.1007/s11886-019-1204-y
22. McCausland K, Maycock B, Leaver T, Jancey J. The messages presented in electronic cigarette-related social media promotions and discussion: Scoping review. *J Med Internet Res*. 2019;21(2). doi:10.2196/11953.
23. Pokhrel P, Herzog TA, Muranaka N, Fagan P. Young adult e-cigarette users' reasons for liking and not liking e-cigarettes: A qualitative study. *Psychol Health*. 2015;30(12):1450-1469. doi:10.1080/08870446.2015.1061129.
24. Maglaling DD, Brown-Johnson C, Prochaska JJ. Associations with e-cigarette use among Asian American and Pacific Islander young adults in California. *Prev Med Rep*. 2016;4:29-32. doi:10.1016/j.pmedr.2016.05.011.
25. Maglaling DD, Le M-N, Yoo GJ, Del Mundo GO. Personal motivations of Asian Americans who use ENDS: A qualitative study. *Am J Health Behav*. 2019;43(4):680-690. doi:10.5993/ajhb.43.4.3.
26. Page MJ, McKenzie JE, Bossuyt PM, et al. The Prisma 2020 statement: An updated guideline for reporting systematic reviews. *The BMJ*. 2021. doi:10.1136/bmj.n71.26
27. Pokhrel P, Herzog TA, Muranaka N, Regmi S, Fagan P. Contexts of cigarette and e-cigarette use among dual users: A qualitative study. *BMC Public Health*. 2015;15:859. doi:10.1186/s12889-015-2198-z.
28. Wills TA, Knight R, Williams RJ, Pagano I, Sargent JD. Risk factors for exclusive e-cigarette use and dual e-cigarette use and tobacco use in adolescents. *Pediatr*. 2015;135(1):e43-e51. doi:10.1542/peds.2014-0760.
29. Substance Abuse and Mental Health Services Administration. Reducing vaping among youth and young adults. 2020. Accessed September 7, 2020. [https://store.samhsa.gov/sites/default/files/SAMHSA\\_Digital\\_Download/PEP20-06-01-003\\_508\\_0.pdf](https://store.samhsa.gov/sites/default/files/SAMHSA_Digital_Download/PEP20-06-01-003_508_0.pdf). 2020.
30. Rosario MH, Johnson DL, Manglallan KS, Phillips KT, Pokhrel P, Okamoto SK. Tobacco use among native Hawaiian and Pacific Islander youth in the U.S. and USAPI: A systematic review of the literature [published online ahead of print, 2021 Aug 23]. *J Ethn Subst Abuse*. 2021;1-16. doi:10.1080/15332640.2021.1965934
31. Nguyen AB. Disaggregating Asian American and Native Hawaiian and Other Pacific Islander (AANHPI) adult tobacco use: Findings from Wave 1 of the population assessment of tobacco and Health (PATH) study, 2013–2014. *J Racial Ethn Health Disparities*. 2019;6(2):356-363. doi:10.1007/s40615-018-00532-1.
32. Nguyen AB, Henrie J, Slavitt WI, Kaufman AR. Beliefs about FDA tobacco regulation, modifiability of cancer risk, and tobacco product comparative harm perceptions: Findings from the hints-FDA 2015. *Prev Med*. 2018;110:1-8. doi:10.1016/j.ypmed.2018.01.011.
33. Kaholokula JK, Okamoto SK, Yee BW. Special issue introduction: Advancing Native Hawaiian and other Pacific Islander health. *Asian Am J Psychol*. 2019;10(3):197-205. doi:10.1037/aap0000167.
34. Okamoto SK, Kulis S, Helm S, Lauricella M, Valdez JK. An evaluation of the Ho'ouina Pono curriculum: A pilot study of culturally grounded substance abuse prevention for rural Hawaiian youth. *J Health Care Poor Underserved*. 2016;27(2):815-833. doi:10.1353/hpu.2016.0061
35. Okamoto SK, Kulis SS, Helm S, Chin SK, Hata J, Hata E, Lee A. An efficacy trial of the Ho'ouina Pono drug prevention curriculum: An evaluation of a culturally grounded substance abuse prevention program in rural Hawaii. *Asian Am J Psychol*. 2019;10(3):239–248. doi:10.1037/aap0000164
36. Phillips KT, Okamoto SK, Johnson DL, Rosario MH, Manglallan KS, Pokhrel P. Correlates of tobacco use among Asian and Pacific Islander Youth and young adults in the U.S.: A systematic review of the literature. *Exp Clin Psychopharmacol*. 2021;29(5):440-455. doi:10.1037/pha0000511.

# Systematic Review of Culturally-Based Breast Cancer Health Studies in Hawai‘i

Jade N. Ching; Joie K. Agard; Mapuana C.K. Antonio DrPH

## Abstract

*Breast cancer disproportionately impacts Native Hawaiian and Pacific Islander communities in Hawai‘i, as exemplified by high breast cancer prevalence and mortality rates. Breast cancer disparities are linked to socio-cultural determinants of health, signifying the importance of culturally-based interventions. This paper systematically reviewed breast cancer studies conducted in Hawai‘i. The literature search yielded 813 published studies, with a final total of 13 peer-reviewed studies that met this paper’s inclusion criteria. All but 1 study incorporated cultural components. By evaluating key intervention components and assessing the quality of each study, the research team aimed to analyze the importance of cultural values in health interventions. Family and spirituality in coping with a cancer diagnosis were key themes in patients’ lived experiences. Other culturally-based components in these studies included community-engaged research and cultural training for health professionals. The collective findings suggest that breast cancer health interventions that incorporate cultural strengths, values, and worldviews may play a central role in reducing the overall breast cancer burden among these communities. The present review advocates for future research to take a more culturally-based strategy in addressing breast cancer health disparities among Native Hawaiian and Pacific Islanders in Hawai‘i.*

## Keywords

*awareness, breast cancer, early detection, Hawai‘i, health promotion, intervention, mammogram, prevention, program, public health*

## Abbreviations

CBPR = Community-based participatory research  
CINAHL = Cumulative Index to Nursing and Allied Health Literature  
NHPI = Native Hawaiian and Pacific Islander  
PRISMA = Preferred Reporting Items for Systematic Reviews  
and Meta-Analyses  
QAT = Quality assessment tool

## Introduction

Breast cancer is the second leading cause of cancer mortality of women in the US, following lung cancer.<sup>1</sup> In 2021, 2811 550 new cases of breast cancer were diagnosed and approximately 43 600 women died due to breast cancer.<sup>2</sup> In Hawai‘i, approximately 170 deaths were attributed to female breast cancer in 2021.<sup>2</sup> Additionally, incidence rates of breast cancer in Hawai‘i were 138.9 cases per 100 000 women, 13% greater than for US women in 2013-2017.<sup>3</sup> Breast cancer mortality rates are particularly high for Native Hawaiian and Pacific Islander (NHPI) women. In 2015, NHPIs had an alarming breast cancer mortality rate of 72.9 deaths per 100 000 women, exceeding

the state’s breast cancer mortality average of 18.7 deaths per 100 000 women, a 290% difference.<sup>4</sup> Additionally, NHPI women have lower mammography rates, greater diagnoses of late-stage breast cancer, and lower 5-year survival rates for breast cancer.<sup>5</sup> There exists an urgent need to explore clinical practices that aim to reduce breast cancer health disparities experienced by NHPI women in Hawai‘i.

Cancer and health disparities experienced by NHPI persons may be attributed to socio-cultural determinants of health, which include lack of medical insurance and difficulty accessing cancer screenings (especially in culturally-safe health care settings<sup>6</sup>)—both of which are pivotal in detecting cancer in early stages and maximizing survivorship.<sup>7</sup> Previous research identifies health disparities as consequences of historical oppression and losses of culture and language due to colonization, resulting in multigenerational trauma.<sup>8</sup> These systematic determinants continue to affect economic and psychosocial landscapes for contemporary NHPI persons.<sup>7,8</sup> In the context of breast cancer, limited access to treatment due to lack of medical insurance, insufficient culturally-based care related to screening and other cancer preventative behaviors and treatment disproportionately affect NHPI persons.<sup>8,9</sup> The cumulative impact of historical trauma may contribute to health disparities including late-stage cancer diagnoses and increased mortality at younger ages for NHPI persons.<sup>9</sup>

Breast cancer interventions for NHPI persons require a deep understanding of cultural values and community engagement.<sup>9,10-13</sup> Western conceptualizations of health are individualistic and fixate on physical symptoms of illness, rather than spiritual and relational elements.<sup>14-16</sup> In contrast, NHPI culture emphasizes the importance of holism and approaches health as being relational.<sup>17</sup> Burgeoning literature highlights the need for culturally-based approaches to addressing health disparities.<sup>13,18</sup> Culturally-based approaches to health may uplift community strengths, potentially rectifying medical mistrust among NHPI persons.

This paper’s purpose was to systematically review existing breast cancer interventions in Hawai‘i to better understand characteristics and intervention components that contribute to favorable health outcomes. Studies were examined to determine whether cultural components and community-engaged approaches enhanced health outcomes. Qualitative studies were also reviewed to identify common themes relating to breast cancer research for NHPI persons.

## Methods

This review includes articles published through June 2022 in PubMed MEDLINE, PsycINFO, and Cumulative Index to Nursing and Allied Health Literature (CINAHL) databases. The Population; Intervention; Comparison; Outcome (PICO) framework was applied to develop the primary search terms: “Hawaii OR Hawai‘i” AND “Prevention OR intervention OR program OR awareness OR education OR screening OR early detection OR health promotion” AND “Breast cancer OR Mammogram OR Mammography.” Final search terms were reviewed by the last author and another expert in the field of cancer research. Unduplicated citations were imported into Rayyan<sup>19</sup> for first-line screening based on title and abstract. Second-line screening was conducted with a full-text review. Then, 2 authors applied the inclusion and exclusion criteria when reviewing the studies. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)<sup>20</sup> guidelines were used for evaluation.

### Inclusion and Exclusion Criteria

Included studies needed to be: (1) a prevention, intervention, or management program, or a qualitative study that would inform future interventions; (2) breast cancer specific; (3) conducted in Hawai‘i; (4) inclusive of adults (18 years or older); and (5) a study that reported outcomes and discussed participants’ lived experiences related to prevention, intervention, or management programs, and/or provided recommendations for future programming. Excluded studies fell under 1 or more of the following characteristics: (1) studies conducted outside of Hawai‘i; (2) literature reviews; (3) studies that did not focus on breast cancer; (4) epidemiological and cross-sectional quantitative studies; (5) interventions that did not include a program (ie, prescription treatment, medicines, or dietary modification) or qualitative outcomes to inform future interventions; and (6) studies that did not report outcomes.

### Assessment of Quality, Community-Engagement, Cultural Integration, and the Socio-Ecological Model

The quality assessment tool (QAT) was used to appraise the quality of quantitative studies.<sup>21</sup> There are 8 components of the QAT: (1) Selection Bias; (2) Study Design; (3) Confounders; (4) Blinding; (5) Data Collection Methods; (6) Withdrawals and Drop-outs; (7) Intervention Integrity; and (8) Analysis Appropriate to Question. Global ratings range from “Strong,” “Moderate,” to “Weak.” Studies with a “Strong” global rating had no “Weak” ratings in any of the 8 components. Studies labeled “Moderate” had 1 “Weak” rating while studies with an overall “Weak” global rating consisted of 2 or more “Weak” ratings in any of the 8 components. To ensure consistency of the assessment, individual definitions were created for this review and applied to intervention-based studies with quantitative outcomes. The QAT was modified to include community engagement and culture in the research process:

(Q3a) “Did researchers take a community-based participatory research (CBPR) approach?” and (Q3b) “Was the importance of culture considered?”) (Appendix Tables A and B).

Authors assessed for community engagement in breast cancer studies. This assessment included the following classifications: community-engaged, CBPR, or community-driven. For this criterion, only 1 classification was assigned, with the greatest level of community engagement being assigned. If a study reported taking a CBPR approach and was community-driven, the authors documented the study as a community-driven intervention. For this review, authors defined community-engaged studies as engagement of community through inquiry of cultural values and through partnerships with community organizations (ie, academic researchers may guide the research process and consult community patterns throughout the process). CBPR is a form of community-engaged research that engages community leaders and stakeholders at all levels of the research process (ie, community and academic researchers engaging in the entire research process together through equitable means).<sup>22</sup> The CBPR approach to research increases collaboration and equity in the research process and acknowledges the strengths of community and academic research partners. Authors identified CBPR studies based on whether the CBPR approach was explicitly stated in the article. Community-driven studies engage the community at each step of the research process; however, the research process itself is led by the community and grounded in community values (ie, a community leader or organization led the entire research process).

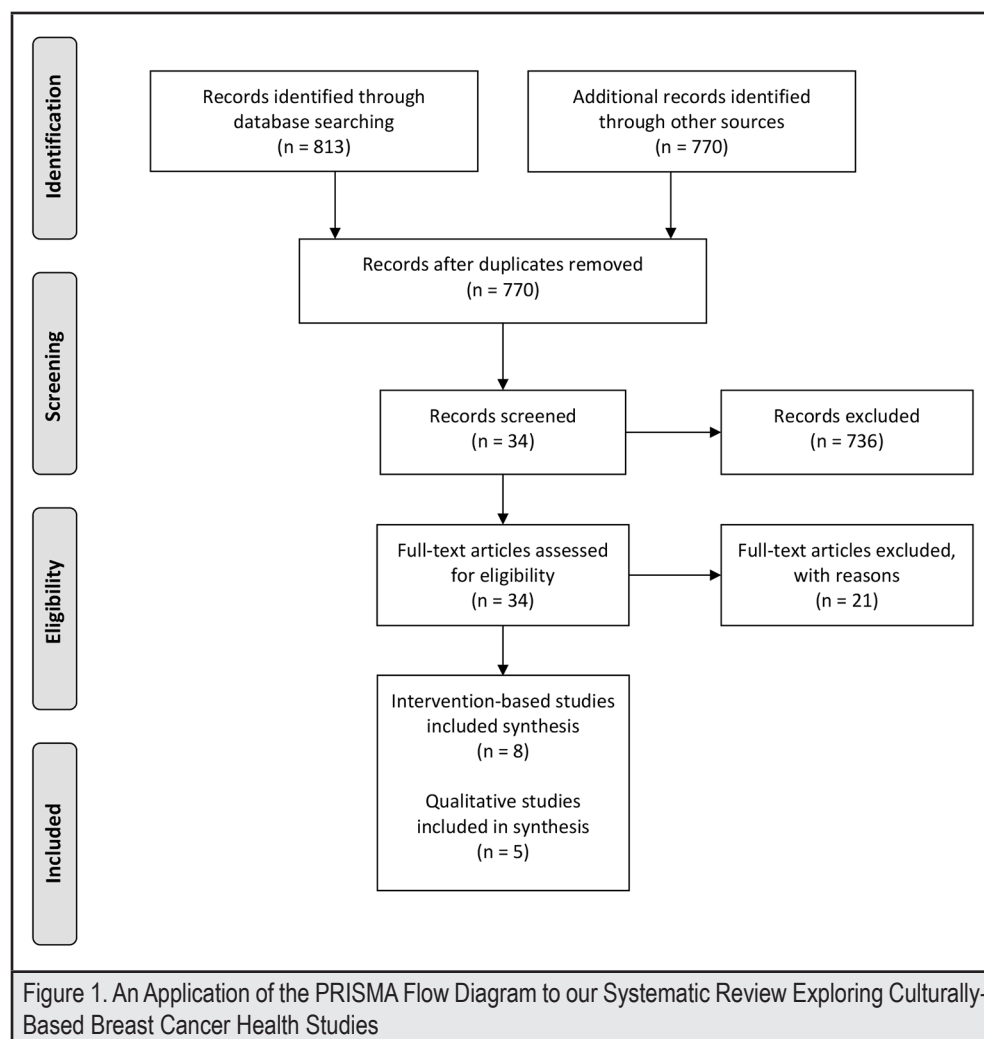
The authors evaluated the integration of cultural components using the cultural continuum.<sup>23</sup> The continuum includes non-adapted programs, surface-structure cultural adaptations, deep-structure cultural adaptations, and culturally-grounded programs. Non-adapted programs consist of generic or universal prevention programs; surface-structure cultural adaptation programs include universal prevention programs with surface-level differences such as changes in names and references to increase receptivity of content; deep-structure cultural adaptation programs are often based on empirically-supported programs, with cultural components and values that reflect participants of the program; and culturally-grounded programs are built from the ground-up based on cultural and social context that reflect participants receiving the program. For the purpose of this review, authors classified a research study as non-adapted, culturally-adapted (including surface-structure cultural adaptations and deep-structure cultural adaptations), or culturally-grounded. Similar to the community engagement criterion, only 1 classification was assigned, with the greatest level of cultural integration. For instance, if a study reported on an intervention that incorporated non-adapted and culturally-adapted components, the authors documented the study as a culturally-adapted intervention. In alignment with indigenous ways of knowing, which honors talk story as being grounded in culture, qualitative studies that used this approach were considered a culturally-grounded study.<sup>10,12,14,15,24</sup>

Studies were also evaluated for their ability to address behaviors on the individual, interpersonal, institutional/organizational, community, and public policy levels based on the socio-ecological model (SEM), a well-known framework in public health that addresses health behaviors at multiple levels including the interpersonal (eg, family), organizational (eg, schools), community (eg, neighborhood), and public policy (eg, local laws) levels.<sup>25</sup> The individual level was marked if a study reported on an individual's knowledge or behavior related to breast cancer health. The interpersonal level was marked if the intervention included social networks (eg, family). The institutional/organizational level was marked if an institution (eg, hospital) played a role in the intervention. The community level was marked if the community played any role in the intervention (eg, church), and the public policy level was marked if the intervention informed larger public health policies. For this criterion, authors documented levels of the SEM included in the results of the intervention-based or qualitative studies.

To ensure consistency of all assessments (ie, QAT, community-engagement, cultural integration, and the SEM), authors assessed 1 of the 13 included studies together, which guided the rest of the data extraction process completed by all authors. Any discrepancies were discussed as a team until consensus was achieved. For instance, if 2 of the 3 authors were in agreement, a discussion took place to identify a middle ground or determine the most appropriate scoring based on the collective group's decision.

## Results

The literature search yielded 813 studies: PubMed ( $n = 730$ ), PsycINFO ( $n = 32$ ), and CINAHL ( $n = 51$ ). A total of 31 studies remained after screening based on titles and abstract. The full-text was reviewed and 12 studies were examined for this review (**Figure 1**).



## Overview of Interventions

The majority of intervention-based studies focused on NHPI persons, particularly Native Hawaiian,<sup>10,12-15,24,26</sup> Pacific Islander,<sup>27</sup> Micronesian,<sup>28</sup> and Filipino<sup>29</sup> communities (**Table 1**). The majority of studies ( $n = 11$ ) focused on women,<sup>10,12-15,24,26-28,30,31</sup> while all qualitative studies focused on Native Hawaiian women.<sup>10,12,14,15,24</sup> The mean age of participants ranged from 40-75 years.<sup>10-15,24,26-31</sup> Several studies were qualitative research designs ( $n = 5$ ).<sup>10,12,14,15,24</sup> Of the 8 intervention-based studies, 4 focused on cancer screening and reported favorable outcomes (eg, increase in mammogram rates).<sup>13,26,28,29</sup> The majority of qualitative studies for this review emphasized social support,<sup>10,13-15,24,26,31</sup> spirituality,<sup>10,12-15,24,30</sup> and physician-patient interactions<sup>10,11,24,29,30</sup> in breast health interventions for Native Hawaiians and other ethnic groups disproportionately affected by cancer (**Table 2**).

## Quality Assessment

Based on the QAT, final global ratings of quantitative studies were either Strong ( $n = 2$ ),<sup>13,26</sup> Moderate ( $n = 1$ ),<sup>31</sup> or Weak ( $n = 5$ ).<sup>11,27,28-30</sup> Scores for the QAT included: (1) Selection Bias: Moderate ( $n = 7$ ) to Strong ( $n = 1$ ); (2) Study Design: Moderate ( $n = 6$ ) to Strong ( $n = 2$ ); (3) Confounders: Strong ( $n = 8$ ); (4) Blinding: Weak ( $n = 6$ ) to Moderate ( $n = 2$ ); (5) Data Collection Methods: Strong ( $n = 8$ ); and (6) Withdrawals and Dropouts:

Weak ( $n = 5$ ) to Strong ( $n = 3$ ). Low scores for Blinding and Withdrawals and Dropouts were due to missing information about participants' awareness of the research questions. Studies typically took place at a community, health care, or clinical setting. There was an overall high level of agreement for QAT ratings among the authors.

## Community Engagement

Of the 13 studies, 12 engaged communities. The remaining study did not report engagement from communities in the research process (**Table 3**).<sup>31</sup> Two studies were community-engaged<sup>26,29</sup> and 2 utilized CBPR principles.<sup>13,28</sup> The majority of studies were community-driven ( $n = 8$ ).<sup>10-12,14,15,24,27,30</sup> Aitaoto et al (2012) increased screening among Micronesian women with Micronesian organizations.<sup>28</sup> Ho et al (2010) engaged the community through partnerships with Filipino organizations to promote breast health awareness.<sup>29</sup> Hughes & Higuchi (2004) addressed screening barriers through community informants and the Native Hawaiian Breast Cancer Sub-Committee (NHBCSC).<sup>11</sup> Ka'opua et al (2011) described results from *Ka Lei Mana'olana* (KLM), a culturally-based educational intervention that employed CBPR principles.<sup>13</sup> Ka'opua (2003) involved key stakeholders in a *ho'oponopono* (traditional Native Hawaiian healing) training for 11 community practitioners.<sup>30</sup> Mokuau et al (2012) established relationships with community stakeholders to recruit

Reference	Observed Variables	Design	Setting	Total Sample	Participant Characteristics	Intervention Duration	QAT Score
Aitaoto et al, 2012	Mammography intent	Cohort	Community	567	Micronesian women (18 to 75 years)	18-months	3
Ho et al, 2010	Mammography intent, physician-patient interactions	Interrupted time series	Community	Not specified	Filipino community 40 years and older)	4-years	3
Hughes & Higuchi, 2004	Health care professionals, physician-patient interactions	Cohort	Clinical	300+	Various health care professionals (age not specified)	3-years	3
Ka'opua, 2003	Health practitioners, physician-patient interactions, spirituality	Cohort	Clinical	10	Women practitioners (average age 50 years)	16-hour training delivered in 2 sessions	3
Ka'opua et al, 2011	Spirituality, family support, mammography intent	RCT	Community	198	Native Hawaiian women (average age 60 years)	12-months	1
Loo et al, 2019	Physical activity	Cohort	Group	11	Asian/Pacific Islander women (average age 63 years)	6-months	3
Mokuau et al, 2012	Family support, self-efficacy, mammography intent	RCT	Home	29	Native Hawaiian women with breast cancer-related experiences (average age 50 years) Native Hawaiian family members (average age 40 years)	4-months	1
Teranishi-Hashimoto et al, 2021	Social support, Physical activity	Cohort	Group	25	Women (average age 55 years)	15-weeks	2

QAT = quality assessment tool, RCT = randomized clinical trial

participants.<sup>26</sup> All qualitative studies were community-driven and guided by indigenous storytelling.<sup>10,12,14,15,24</sup> Storytelling is a method that promotes healing through a resilience process where participants may share more about their experiences in a manner reminiscent of traditional Pacific and Hawaiian oral storytelling. For instance, Ka'opua & Anngela (2005) indicated that their focus group discussions on screening experiences were enhanced through culturally-familiar talk story approaches.<sup>12</sup>

Similarly, interviews conducted by Ka'opua et al (2008) were also enhanced through the talk story approach. This approach encouraged Native Hawaiian participants to share their cancer-related experiences in a culturally-familiar manner, providing deeper insight into cultural details and the experience of breast cancer survivorship.<sup>15</sup>

Reference	Observed Variables	Qualitative Design	Setting	Total Sample	Participant Characteristics	Intervention Duration
Eide, 2006	Family support, spirituality, physician-patient interactions	phenomenological study	Interview (talk story)	11	Native Hawaiian women (44 to 82 years)	Not reported
Ka'opua, 2008	Spirituality, family support	semi-structured interview design	Semi-structured interview (talk story)	60	Native Hawaiian women (average age 65 years)	Not reported
Ka'opua & Anngela, 2005	Spirituality	semi-structured interview design	Semi-structured interview (talk story)	50	Native Hawaiian women (average age 69.88 years)	Not reported
Ka'opua et al, 2008	Spirituality, spiritually-based resources, family support	semi-structured interview design	Semi-structured interview (talk story)	7	Native Hawaiian women and men (average age 59 years)	5-years
Mokuau & Braun, 2007	Family support, spirituality, physician-patient interactions	formative research design	Interview	25	Native Hawaiian women breast cancer survivors (average age 68 years) Native Hawaiian family members (average age 46 years)	4-months

Socio-Ecological Model								
Reference	QAT	Community Engagement	Cultural Continuum	Individual	Inter-personal	Organizational	Community	Public Policy
Intervention Based Studies								
Aitaoto et al, 2012	3	CBPR	Culturally adapted	X	X	X	X	
Ho et al, 2010	3	Community engaged	Culturally adapted	X	X	X	X	X
Hughes & Higuchi, 2004	3	Community driven	Culturally grounded	X	X	X	X	X
Ka'opua, 2003	3	Community driven	Culturally grounded	X	X	X	X	X
Ka'opua et al, 2011	1	CBPR	Culturally adapted	X			X	
Loo et al, 2019	3	Community driven	Culturally grounded	X	X		X	
Mokuau et al, 2012	1	Community engaged	Culturally adapted	X	X		X	
Teranishi-Hashimoto et al, 2021	2	No engagement	Non-adapted program	X	X	X	X	
Qualitative Studies								
Eide, 2006	N/A	Community driven	Culturally grounded	X	X	X	X	
Ka'opua & Anngela, 2005	N/A	Community driven	Culturally grounded	X	X	X	X	X
Ka'opua et al, 2008	N/A	Community driven	Culturally grounded	X	X	X	X	X
Ka'opua, 2008	N/A	Community driven	Culturally grounded	X	X	X	X	X
Mokuau & Braun, 2007	N/A	Community driven	Culturally grounded	X	X	X	X	X

## Cultural Continuum Assessment

Studies typically employed culturally-based approaches to increase screening. Of the 13 studies, 12 incorporated culture, with varying levels of cultural integration (Table 3). The remaining study did not incorporate culture nor took a community-engaged research approach (as mentioned above) but still yielded favorable health outcomes, specifically related to physical quality of life.<sup>31</sup> Four intervention-based studies culturally-adapted their interventions,<sup>13,26,28,29</sup> while 3 intervention-based studies<sup>11,27,30</sup> and 5 of the qualitative studies took a culturally-grounded approach.<sup>10,12,14,15,24</sup> Common cultural values cited as an important theme or intentionally included in intervention-based studies included family support and spirituality (eg, prayer).<sup>10,12,14,15,24</sup> Cultural practices and traditional healing were included in the intervention process for 2 studies.<sup>27,30</sup> Ka'opua (2003) conducted a feasibility study integrating ho'oponopono,<sup>32</sup> a process of healing physical ailments by identifying spiritual/interpersonal conflicts.<sup>30</sup> Loo et al (2019) demonstrated the feasibility of a Hula Dance intervention to increase physical activity among breast cancer survivors.<sup>27</sup> Hughes and Higuchi (2004) reported on the *Ka Lōkahi Wāhine* training for health professionals which featured a culturally-inclusive training video and manual on Native Hawaiian values.<sup>11</sup>

## SEM Outcomes

Based on the SEM, all studies were marked on the individual and community levels.<sup>10-15,24,26-31</sup> All but one study was marked as interpersonal.<sup>10-12,14,15,24,26-31</sup> Ten out of the 13 studies were marked on the institutional/organizational level<sup>10-12,14,15,24,28-31</sup> and only 7 studies were marked as public policy (Table 3).<sup>11,12,14,15,24,29,30</sup>

## Specific Outcomes for Intervention-Based Studies

Aitaoto et al (2012) increased screening compliance by 70% using educational materials incorporating Micronesian values.<sup>28</sup> Ho et al (2010) increased mammography rates by 9.3% through partnerships with the Filipino community.<sup>29</sup> Hughes & Higuchi (2004) indicated increased cultural knowledge among physicians, including spirituality, which is often underrepresented in health care.<sup>6,11,15</sup> Ka'opua (2003) increased adherence of *ho'oponopono* ( $P < .001$ ) among health practitioners.<sup>30</sup> Ka'opua et al (2011) increased breast cancer awareness ( $\chi^2 = 6.82, P < .01$ ) and mammogram intent ( $\chi^2 = 6.52, P < .05$ ).<sup>13</sup> Loo et al (2019) increased weekly moderate exercise in 73% of participants.<sup>27</sup> Mokuau et al (2012) demonstrated mastery of learning objectives and satisfaction with culturally-tailored educational materials among participants and their families (>86% in all categories) (Table 4).<sup>26</sup>

Table 4. Specific Outcomes for Intervention-Based Studies and Themes for Qualitative Studies	
Reference	Specific Outcomes
<b>Intervention-Based Studies</b>	
Aitaoto et al, 2012	Increased health awareness and health prevention, 70% increase in screening compliance.
Ho et al, 2010	Mammography screening rates significantly increased 9.3% from 2002 to 2008.
Hughes & Higuchi, 2004	Increased cultural knowledge and competency among health professionals, No specific statistics listed.
Ka'opua, 2003	Increased cultural competence and adherence of ho'oponopono, an Indigenous Hawaiian healing tradition, ( $P < .001$ ) among health practitioners.
Ka'opua et al, 2011	Increased awareness ( $\chi^2 = 6.82, P < .01$ ) and indicated greater intent to seek yearly mammograms ( $\chi^2 = 6.52, P < .05$ ).
Loo et al, 2019	Increased weekly moderate exercise in 73% of women enrolled in the intervention trial. Increased ( $P < .001$ ) in vigor during the intervention and post-intervention.
Mokuau et al, 2012	Mastery of learning objectives of the intervention, satisfaction with informational sessions and tailored educational materials among all participants and their families (>86% in all categories).
Teranishi-Hashimoto et al, 2021	Total QOL was improved ( $P < .05$ ), Body fat percentage and waist and hip circumferences were significantly reduced after the intervention ( $P < .05$ ).
<b>Qualitative Studies</b>	
Eide, 2006	Spirituality, social support, and appreciation of one's Hawaiian identity and cultural values (including restoring pono) were emphasized.
Ka'opua, 2008	The collective experience of a cancer diagnosis, social support, spirituality including holistic well-being, promotion of breast cancer awareness and hopeful messages from other Hawaiian breast cancer survivors, and implementation of Hawaiian cultural values and practices in breast cancer programs were emphasized.
Ka'opua & Anngela, 2005	Spirituality, Hopeful messages by church leaders and other Hawaiian breast cancer survivors), Collectivistic-oriented values were emphasized.
Ka'opua et al, 2008	Spirituality, social support, collectivistic values, and trusted community members and spiritual leaders as messengers for promoting screening were emphasized.
Mokuau & Braun, 2007	Sources of support (including family support, individual responsibility for health, and responsibility to the collective family), spirituality, types of support (including informational, tangible, and emotional support, and recommendations for health care to include cultural values were emphasized.

## Themes for Qualitative Studies

All qualitative studies took a culturally-grounded approach which allowed for an exploration of themes related to breast cancer processes and outcomes, but also health as a whole. Common themes identified in qualitative studies included spirituality, social support, physician-patient interactions, and cultural values to facilitate screening. All qualitative studies emphasized the importance of spirituality (eg, prayer) and social support (eg, community).<sup>10,12,14,15,24</sup> Church-settings and church leaders were cited as potential messengers to promote screening.<sup>12,14</sup> All qualitative studies emphasized Native Hawaiian cultural values, particularly relating to family.<sup>10,12,14,15,24</sup> Native Hawaiian patients in 1 qualitative study recommended that health care strengthen family support through patient-family-physician counseling (**Table 4**).<sup>24</sup>

## Discussion

This paper systematically reviewed 13 breast cancer studies conducted in Hawai‘i, including 8 intervention-based studies<sup>11,13,26-31</sup> and 5 qualitative studies.<sup>10,12,14,15,24</sup> This review suggests that qualitative approaches, particularly talk story, encourage participants to share their cancer-related experiences in a culturally-based manner and hold relevant cultural detail for future research and practice in receptivity of health interventions.<sup>10,12,14,15</sup> The studies included in this review may be used as templates for culturally-based health interventions for NHPI persons and will likely contribute to favorable outcomes (eg, higher mammography rates).

Given the importance of culturally-based interventions,<sup>33</sup> it is not surprising that 12 of the 13 studies were assessed as either “Culturally-adapted” ( $n = 4$ )<sup>13,26,28,29</sup> or “Culturally-grounded” ( $n = 8$ ).<sup>10,12,14,15,24,27,30</sup> Culturally-grounded interventions that increase cultural knowledge and competency of cultural values among physicians, such as spirituality for NHPI, may affect the receptivity of health interventions among NHPI persons and thus indicates the importance of spirituality in relation to health outcomes.<sup>11,30</sup> Furthermore, using culturally-grounded interventions has also been associated with favorable physical health outcomes, such as increase in physical activity, among NHPI persons.<sup>27</sup> Culturally-adapted programs demonstrated favorable outcomes such as increased health awareness and mammography screening rates.<sup>13,26,28,29</sup> These findings implicate the importance of integrating cultural values in health care to enhance holistic quality of life (physical, mental, spiritual, and emotional) for Hawai‘i’s diverse communities and indicate a pressing need to better understand holistic perspectives of health for NHPI persons in health care.

Community engagement also ensures the research process is grounded in culture, as demonstrated by the interventions included in this study. Particularly, studies using a CBPR approach or a community-driven approach increased favorable behavioral health outcomes (eg, increased mammography rates), health awareness and prevention, and cultural competency. Existing

literature also identifies the importance of engaging the family collective in health interventions for NHPI communities.<sup>16,34</sup> Particularly, the qualitative studies in this paper that explored familial support in cancer care among Native Hawaiian families indicated that the burden of a cancer diagnosis is experienced as a collective and that members have a shared commitment to care for one another.<sup>10,13-15,24,26</sup> Therefore, cancer screening may be framed as a commitment to family to incentivize screening participation. Similarly, other literature emphasizes inclusion of spirituality, spiritual leaders, and church settings which may increase screening participation among NHPI persons.<sup>8,34</sup> Although 1 study did not engage the community, this study took a multi-level approach by engaging groups of people in exercise therapy, which may organically create a sense of community among participants.<sup>31</sup> It may also be true that structuring meeting times to engage in the exercise-based intervention allowed participants to create a sense of community among participants thereby increasing quality of life and the behaviors associated with the aims of the intervention. The aforementioned study may support a multi-level approach to influence an individual’s health without engagement from the community; however, a study that takes a multi-level approach and also a cultural and community-based approach may have better overall health outcomes. This hypothesis is validated through other multi-level studies involving NHPI persons. For example, Ho et al (2010) and Hughes & Higuchi (2004) incorporated all levels and saw that participants also had increased knowledge and cultural competency.<sup>11,29</sup>

Like other systematic reviews, this paper is limited to selected search terms and databases as well as the interpretations of the authors. Similarly, this review may be limited by 13 studies with 5 out of 8 of the quantitative studies rated as “weak.” The results of the 13 studies included in this review may not be indicative of the NHPI community as a whole. This review does not consider grey literature, which has not been formally published in a peer-reviewed journal but may still contain pertinent information.<sup>35</sup> Nonetheless, the review’s strengths include the evaluation of breast cancer programs specific to Hawai‘i with an exploration of programs geared towards diverse communities.

## Conclusion

Despite increased efforts to address cancer health disparities among NHPI persons in Hawai‘i, cancer continues to have a marked impact on this population’s health. This review reiterates the importance of integrating cultural values in addressing cancer health disparities. In particular, family, community, and spiritual-based approaches take a multi-level and holistic approach to health, enhancing cultural sensitivity. A community-based and culturally-safe approach to breast cancer interventions may enhance the cultural relevance of breast cancer interventions and quality of health care for Hawaii’s diverse communities. To eliminate health disparities for NHPI communities related to breast cancer, it is pivotal to take a multi-level, community-based, and culturally-based approach.



## Conflict of Interest

None of the authors identify a conflict of interest.

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## References

- DeSantis CE, Ma J, Gaudet MM, et al. Breast cancer statistics, 2019. *CA Cancer J Clin*. 2019;69(6):438-451. doi:10.3322/caac.21583
- American Cancer Society. *Cancer Facts & Figures 2021*. American Cancer Society. Published 2021. Accessed September 29, 2021. <https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2021/cancer-facts-and-figures-2021.pdf>
- Hawaii Health Matters. *Breast Cancer Incidence Rate*. Hawaii Health Matters. Published 2018. Accessed September 29, 2021. <https://www.hawaiihealthmatters.org/indicators/index/view?indicatorId=180&localeId=14.2021>
- Hawaii Health Matters. *Breast Cancer Death Rate*. Published 2020. Accessed September 29, 2021. <https://www.hawaiihealthmatters.org/indicators/index/view?indicatorId=1232&localeId=14&localeCharIdxs=1|3.2017>
- Look MA, Trask-Batti MK, Agres R, Mau ML, & Kaholokula JK. (2013). Assessment and priorities for health & well-being in Native Hawaiians & other Pacific peoples. Honolulu, HI: Center for Native and Pacific Health Disparities Research, University of Hawai'i. Published 2013. Accessed September 29, 2021. [https://www2.jabsom.hawaii.edu/native/docs/community/DNHH\\_Assessment&Priorities\\_Report\\_2013.pdf](https://www2.jabsom.hawaii.edu/native/docs/community/DNHH_Assessment&Priorities_Report_2013.pdf)
- Santos L, Mokuau N, Abrigo L, et al. 'Imi Hale: Establishing an inheritance for Native Hawaiians on cancer awareness, research and training. *Pac Health Dialog*. 2001;8(2):436-445. <http://pacifhealthdialog.org/fj/Volume208/No220The20Health20of20the20Hawaiians/Pacific20Health20Institutions/IMH2013.PDF>
- Taparra K, Miller RC, Deville C. Navigating Native Hawaiian and Pacific Islander cancer disparities from a cultural and historical perspective. *JCO Oncol Pract*. 2021;17(3):130-134. doi:10.1200/OP.20.00831
- Mokuau N, DeLeon PH, Kaholokula JK, et al. Challenges and promise of health equity for Native Hawaiians. *NAM Perspect*. 2016;6(10):1-11. doi:10.31478/201610
- Braun KL, Mokuau N, Hunt GH, et al. Supports and obstacles to cancer survival for Hawaii's Native people. *Cancer Practice*. 2002;10(4):192-200. doi:10.1046/j.1523-5394.2002.104001.x
- Eide P. Native Hawaiian women and the experience of breast cancer. *Women Health*. 2006;44(4):41-59. doi:10.1300/j013v44n04\_03
- Hughes CK, Higuchi P, Ka Lōkahi Wāhine. A culturally based training for health professionals. *Pac Health Dialog*. 2004;11(2):166-169. <http://pacifhealthdialog.org/fj/Volume2011/no2/PHD1120220p1662016920Hughes20orig.pdf>
- Ka'opua LS, Anngela L. Developing a spiritually based breast cancer screening intervention for Native Hawaiian women. *Cancer Control*. 2005;12 Suppl 2:97-99. doi:10.1177/1073274805012004S15
- Ka'opua LSI, Park SH, Ward ME, Braun KL. Testing the feasibility of a culturally tailored breast cancer screening intervention with Native Hawaiian women in rural churches. *Health Soc Work*. 2011;36(1):55-65. doi:10.1093/hsw/36.1.55
- Ka'opua LS. Developing a culturally responsive breast cancer screening promotion with Native Hawaiian women in churches. *Health Soc Work*. 2008;33(3):169-177. doi:10.1093/hsw/33.3.169
- Ka'opua LSI, Mitschke DB, Kloezeman KC. Coping with breast cancer at the nexus of religiosity and Hawaiian culture: Perspectives of Native Hawaiian survivors and family members. *J Relig Spiritual Soc Work*. 2008;27(3):275-295. doi:10.1080/15426430802202187
- McLean KL, Hata J, Hata E, et al. Deep-structure adaptations and culturally grounded prevention interventions for Native Hawaiians: A systematic review of the literature. *J Racial Ethn Health Disparities*. 2021;8(3):570-578. doi:10.1007/s40615-020-00815-6
- Antonio MCK, Keaulana S, Chung-Do JJ, Ho-Lastimoso I. (Re)constructing conceptualizations of health and resilience among Native Hawaiians. *Genealogy*. 2020;4(1):8. doi:10.3390/genealogy4010008
- Braun KL, Tsark JU, Santos L, et al. Building Native Hawaiian capacity in cancer research and programming: A legacy of 'Imi Hale. *Cancer*. 2006;107(Suppl 8):2082-2090. doi:10.1002/cncr.22157
- Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan-A web and mobile app for systematic reviews. *Syst Rev*. 2016;5(1):210. doi:10.1186/s13643-016-0384-4
- Moher D, Liberati A, Tetzlaff J, Altman DG; PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Med*. 2009;6(7):e1000097. doi:10.1371/journal.pmed.1000097
- Effective Public Health Practice Project. *Quality assessment tool for quantitative studies*. Effective Public Health Practice Project. Published 1998. Accessed September 29, 2021. <https://www.nccmt.ca/knowledge-repositories/search/14>
- Minkler M, Blackwell AG, Thompson M, Tamir H. Community-based participatory research: Implications for public health funding. *Am J Public Health*. 2003;93(8):1210-1213. doi:10.2105/ajph.93.8.1210
- Okamoto SK, Kulis S, Marsiglia FF, et al. A continuum of approaches toward developing culturally focused prevention interventions: From adaptation to grounding. *J Prim Prev*. 2014;35(2):103-112. doi:10.1007/s10935-013-0334-z
- Mokuau N, Braun KL. Family support for Native Hawaiian women with breast cancer. *J Cancer Educ*. 2007;22(3):191-196. doi:10.1007/BF03174336
- McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. *Health Educ Q*. 1988;15(4):351-377. doi:10.1177/109019818801500401
- Mokuau N, Braun KL, Daniggelis E. Building family capacity for Native Hawaiian women with breast cancer. *Health Soc Work*. 2012;37(4):216-224. doi:10.1093/hsw/hls033
- Loo LWM, Nishibun K, Welsh L, et al. Using a cultural dance program to increase sustainable physical activity for breast cancer survivors: A pilot study. *Complement Ther Med*. 2019;47:102197. doi:10.1016/j.ctim.2019.102197
- Aitaoto N, Braun KL, Estrella J, Epeluk A, Tsark J. Design and results of a culturally tailored cancer outreach project by and for Micronesian women. *Prev Chronic Dis*. 2012;9:E82. doi:10.5888/pcd9.100262
- Ho R, Muraoka M, Cuaresma C, Guerrero R, Agbayani A. Addressing the excess breast cancer mortality in Filipino women in Hawaii through AANCART, an NCI Community Network Program. *Hawaii Med J*. 2010;69(7):164-166. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3118029/pdf/hmj6907\\_0164.pdf](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3118029/pdf/hmj6907_0164.pdf)
- Ka'opua LSI. Training community practitioners in a research intervention: Practice examples at the intersection of cancer, Western science, and Native Hawaiian healing. *Cancer Control*. 2003;10(5 Suppl):5-12. doi:10.1177/107327480301005s02
- Teranishi-Hashimoto C, Bantum EO, Conde F, Lee E, Yamada PM. Group-based exercise therapy improves psychosocial health and physical fitness in breast cancer patients in Hawaii. *Hawaii J Health Soc Welf*. 2021;80(11):263-269. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8571815/pdf/hjhs8011\\_0263.pdf](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8571815/pdf/hjhs8011_0263.pdf)
- Pukui MK, Haertig EW, Lee CA. *Nana I Ke Kumu (Look to the Source) Volume 1*. Honolulu, Hawaii: Hui Hanai; 1972
- Kaholokula JK, Ing CT, Look MA, Delafield R, Sinclair K. Culturally responsive approaches to health promotion for Native Hawaiians and Pacific Islanders. *Ann Hum Biol*. 2018;45(3):249-263. doi:10.1080/03014460.2018.1465593
- Look MA, Soong S, Kaholokula JK. Assessment and priorities for health and well-being in Native Hawaiians and Pacific Islanders. Accessed July 6, 2022. [https://dnhh.hawaii.edu/wp-content/uploads/2020/11/NPHI\\_HlthAssessmentPriorities\\_Rpt2020.pdf](https://dnhh.hawaii.edu/wp-content/uploads/2020/11/NPHI_HlthAssessmentPriorities_Rpt2020.pdf)
- Hopewell S, McDonald S, Clarke M, Egger M. Grey literature in meta-analyses of randomized trials of health care interventions. *Cochrane Database Syst Rev*. 2007;2007(2):MR000010. doi:10.1002/14651858.MR000010.pub3

Appendix Table A. Modified Quality Assessment Tool Definitions to Include Community Engagement and Culture in the Research Process					
Component	Question	“N/A” and “No” will be scored the same.			
A) SELECTION BIAS	(Q1) Are the individuals selected to participate in the study likely to be representative of the target population?	Mark “Very likely” if randomized.	Mark “Somewhat likely” if referred, but not random	Mark “Not likely” if self-referred.	“Can’t tell.”
	(Q2) What percentage of selected individuals agreed to participate?	Must explicitly state the exact percentage, otherwise mark as “Can’t tell.”			
	Rate this section	No modified definition listed.			
B) STUDY DESIGN	Indicate the study design	No modified definition listed.			
	Was the study described as randomized? If NO, go to Component C.	No modified definition listed.			
	If Yes, was the method of randomization described? (See dictionary)	No modified definition listed.			
	If Yes, was the method appropriate? (See dictionary)	No modified definition listed.			
	Rate this section	No modified definition listed.			
C) CONFOUNDERS	(Q1) Were there important differences between groups prior to the intervention?	Must explicitly state if there are significant differences at baseline between two groups.			
	(Q2) If yes, indicate the percentage of relevant confounders that were controlled (either in the design (eg, stratification, matching) or analysis)?	Must explicitly state the exact percentage at baseline or pre-intervention.			
	Rate this section	Any study marked “Weak” or “Moderate” for the study design, should also be marked “Strong” in C) CONFOUNDERS section.			
D) BLINDING	(Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?	No modified definition listed.			
	(Q2) Were the study participants aware of the research question?	If participants directly receiving an intervention are unaware of the research question, mark as “Can’t tell.”			
	Rate this section	If (Q1 is 1), and if (Q2 is 3), mark as “Weak.”			
E) DATA COLLECTION METHODS	(Q1) Were data collection tools shown to be valid?	A study is valid if it measured what it intended to measure. Talk story will be viewed as a valid method.			
	(Q2) Were data collection tools shown to be reliable?	A study is reliable if the data collection is consistent.			
	Rate this section	No modified definition listed.			
F) WITHDRAWALS AND DROP-OUTS	(Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?	If explicitly stated for participants receiving the intervention, mark “Yes.” If there is no report on how many participants dropped out or reasons, mark as “Can’t tell.” If Q1 is “Can’t tell,” Q2 will also be “Can’t tell.” For one time surveys or interviews mark “N/A.”			
	(Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest)	No modified definition listed.			
	Rate this section	No modified definition listed.			
G) INTERVENTION INTEGRITY	(Q1) What percentage of participants received the allocated intervention or exposure of interest?	No modified definition listed.			
	(Q2) Was the consistency of the intervention measured?	No modified definition listed.			
	(Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?	If explicitly stated for participants receiving the intervention, mark “Yes.” If it is not explicitly stated, mark as “Can’t tell.”			
H) ANALYSES	(Q1) Indicate the unit of allocation (circle one)	Who received the intervention?	Anytime an institution plays a role in the intervention process, mark “Organizational/institution.”	Churches will be considered “Community.”	Practice/office-clinical settings will also be considered part of the organizational level (due to level of uncertainty).
	(Q2) Indicate the unit of analysis (circle one)	Is there a final analysis or actual outcome presented?			
	(Q3) Are the statistical methods appropriate for the study design?	Is the study appropriate for the community?			
	(Q3a) Did researchers take a CBPR approach?	No modified definition listed.			
	(Q3b) Was the importance of culture considered?	No modified definition listed.			
	(Q4) Is the analysis performed by intervention allocation status (ie, intention to treat) rather than the actual intervention received?	Was there actual treatment provided? (ie, “The researchers did/did not treat participants”). Informing future interventions will not be considered as intention-to-treat.			
	Rate this section	No modified definition listed.			
Global Rating	1, 2, or 3?	No modified definition listed.			

Appendix Table B. An Application of the Quality Assessment Tool for Intervention-Based Studies to our Systematic Review Exploring Culturally-Based Breast Cancer Health Studies

Modified Quality Assessment Tool to Critically Appraise the Quality of Intervention-Based Studies									
Component	Question	Aitaoto et al, 2012	Ho et al, 2010	Hughes & Higuchi, 2004	Ka'opua, 2003	Ka'opua et al, 2011	Loo et al, 2019	Mokuau et al, 2012	Teranishi – Hashimoto et al, 2021
A) SELECTION BIAS	(Q1) Are the individuals selected to participate in the study likely to be representative of the target population?	Somewhat likely	Not likely	Somewhat likely	Somewhat likely	Very likely	Somewhat likely	Somewhat likely	Somewhat likely
	(Q2) What percentage of selected individuals agreed to participate?	Can't tell	Can't tell	Can't tell	Can't tell	80-100% agreement	80-100% agreement	80-100% agreement	Can't tell
	Rate this section	Moderate	Moderate	Moderate	Moderate	Strong	Moderate	Moderate	Moderate
B) STUDY DESIGN	Indicate the study design	Cohort	Interrupted time series	Cohort	Cohort	RCT	Cohort	RCT	Cohort
	Was the study described as randomized? If NO, go to Component C.	No	No	No	No	Yes	No	Yes	No
	If Yes, was the method of randomization described? (See dictionary)	No	No	No	No	Yes	No	No	No
	If Yes, was the method appropriate? (See dictionary)	No	No	No	No	Yes	No	Yes	No
	Rate this section	Moderate	Moderate	Moderate	Moderate	Strong	Moderate	Strong	Moderate
C) CONFOUNDERS	(Q1) Were there important differences between groups prior to the intervention?	No	No	No	No	No	No	No	No
	(Q2) If yes, indicate the percentage of relevant confounders that were controlled (either in the design (eg, stratification, matching) or analysis)?	Can't tell	Can't tell	Can't tell	Can't tell	Can't tell	Can't tell	N/A	Can't tell
	Rate this section	Strong	Strong	Strong	Strong	Strong	Strong	Strong	Strong
D) BLINDING	(Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?	Yes	Yes	Yes	Yes	No	Yes	Can't tell	Yes
	(Q2) Were the study participants aware of the research question?	Can't tell	Can't tell	Yes	Yes	Yes	Yes	Can't tell	Yes
	Rate this section	Weak	Weak	Weak	Weak	Moderate	Weak	Moderate	Weak
E) DATA COLLECTION METHODS	(Q1) Were data collection tools shown to be valid?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	(Q2) Were data collection tools shown to be reliable?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Rate this section	Strong	Strong	Strong	Strong	Strong	Strong	Strong	Strong
F) WITHDRAWALS AND DROP-OUTS	(Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?	Can't tell	Can't tell	Can't tell	Yes	Yes	Can't tell	Yes	Yes
	(Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest)	Can't tell	Can't tell	Can't tell	Can't tell	80-100%	Can't tell	80-100%	80-100%
	Rate this section	Weak	Weak	Weak	Weak	Strong	Weak	Strong	Strong
G) INTERVENTION INTEGRITY	(Q1) What percentage of participants received the allocated intervention or exposure of interest?	80-100%	60-79%	80-100%	80-100%	80-100%	60-79%	80-100%	80-100%
	(Q2) Was the consistency of the intervention measured?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	(Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?	Yes	Can't tell	Can't tell	Can't tell	Yes	Yes	Yes	Can't tell

Appendix Table B. An Application of the Quality Assessment Tool for Intervention-Based Studies to our Systematic Review Exploring Culturally-Based Breast Cancer Health Studies (Continued)

Component	Question	Aitaoto et al, 2012	Ho et al, 2010	Hughes & Higuchi, 2004	Ka'opua, 2003	Ka'opua et al, 2011	Loo et al, 2019	Mokuau et al, 2012	Teranishi - Hashimoto et al, 2021
H) ANALYSES	(Q1) Indicate the unit of allocation (mark one)								
	Individual	X	X	X	X	X	X	X	X
	Practice/office	X	X	X	X	X	X	X	X
	Org/institution	X	X	X	X	X	X	X	X
	Community	X	X		X	X			X
	(Q2) Indicate the unit of analysis (mark one)								
	Individual	X	X	X	X	X	X	X	X
	Practice/office		X	X	X	X			
	Org/institution		X	X	X	X			
	Community	X	X	X		X			
	(Q3) Are the statistical methods appropriate for the study design?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	(Q3a) Did the researchers take a CBPR approach?	Yes	No	No	No	Yes	No	No	No
	(Q3b) Was the importance of culture considered?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
(Q4) Is the analysis performed by intervention allocation status (ie, intention to treat) rather than the actual intervention received?	No	No	Yes	No	Yes	No	No	Yes	
Global Rating	1 (strong), 2 (moderate), or 3 (weak)?	3	3	3	3	1	3	1	2

# MEDICAL SCHOOL HOTLINE

## The Value of Medical Student Mentorship in Surgical Specialties

Kyle K. Obana MD; William G. Obana MD

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

AAMC = Association of American Medical Colleges

JABSOM = John A. Burns School of Medicine

LOR = Letter of recommendation

USMLE = United States Medical Licensing Exam

*"If I have seen further it is by standing on the shoulders of giants." – Isaac Newton<sup>1</sup>*

### Introduction

Mentorship holds a historical role in surgery, facilitating the dynamic, long-term, and symbiotic relationship between mentor and student. Mentors provide career guidance, clinical and operative knowledge, research opportunities, networking, and sponsorship. In turn, students gain research opportunities, keep the mentor current, and provide the mentor gratification. This relationship benefits the institution, improving research productivity, faculty satisfaction, and educational performance.<sup>2</sup>

Surgical specialties are becoming more popular as residency applications have rapidly outpaced available positions (**Figure 1**).<sup>3-5</sup> Students at the John A. Burns School of Medicine (JABSOM) consistently pursue surgical specialties, with the majority matching into general surgery, orthopaedic surgery, and ophthalmology (**Table 1**). From 2017-2023, 16% of successfully matched JABSOM students entered surgical specialties, including 25% of students in 2023 (**Figure 2**). Given the rising competitiveness of attaining a surgical residency, the value of long-term mentorship cannot be understated. However, various challenges to attaining quality mentorship exist that are consequential to priorities and infrastructures of academic institutions. The purposes of this article are to highlight the barriers students face in attaining quality surgical mentorship, the importance of mentorship during medical school, and the ways students can find and utilize mentorship.

### Barriers to Mentorship

Regardless of where students attend medical school, there will be barriers to finding high-quality mentorship. This is

attributed to oversaturation of students pursuing a specialty, mentors with limited time, mentors uninvested in students' careers, or difficulty accessing mentors.<sup>6-10</sup> Although 95% of medical students perceive mentorship as important, only 33% have access to it.<sup>11</sup> The main limitation to surgical mentorship at JABSOM is the availability of mentors with adequate time. On the 2022-2023 JABSOM career advisor list, there are 21 advisors listed for general surgery, neurosurgery, ophthalmology, orthopaedic surgery, otolaryngology, plastic surgery, urology, and vascular surgery. However, there is only 1 advisor listed for ophthalmology, orthopaedic surgery, plastic surgery, urology, and vascular surgery. By contrast, there are 18 advisors for internal medicine, 8 for psychiatry, 6 for pediatrics, and 5 for family medicine. Although one may argue that the number of advisors is relatively proportional to the number of students applying into that respective specialty, students with 1 advisor option are at a disadvantage if the advisor has limited availability, connections, and responsiveness, or if the student is looking for multiple perspectives. Consequently, many students must spend additional time and effort seeking mentors who are the right match within the community. This is not an easy task.

Intuitively, adding more advisors would overcome this barrier. However, these are primarily voluntary roles. If a physician in private practice sacrifices clinical and/or operative time to meet with students, then this becomes a financial burden. If a physician sacrifices his/her free time, then this becomes a personal and/or family burden. Allocating funds, particularly for surgeons in private practice, and incorporating protected advising time for employed physicians can mitigate potential burdens.<sup>12-17</sup>

Furthermore, there is no formal surgical mentorship program at JABSOM compared to other medical schools.<sup>18-24</sup> Studies demonstrate a positive correlation between a formal surgical curriculum and the formation of mentor-student relationships.<sup>22,23,25</sup> Implementation of a preclinical one-on-one mentorship program would be beneficial, as the majority of surgical residents find a mentor during their first 2 years of medical school.<sup>26</sup> Additionally, over 80% of students entering plastic and orthopaedic surgery have attributed their decision to pursue the specialty or a specific residency program to an influential mentor.<sup>23,27</sup> For example,

the New York University Neurosurgery Mentorship Program connects students with potential mentors who can offer career guidance, shadowing opportunities, and research.<sup>18</sup> This may benefit students regardless of intended specialty, as a one-on-one otolaryngology mentorship program helped students feel more prepared for clinical years.<sup>21</sup> This is a consideration given the recent transition of the United States Medical Licensing Exam (USMLE) Step 1 becoming pass/fail, which was previously an important objective metric used to screen and evaluate residency applicants, as well as the removal of the USMLE Step 2 Clinical Skills exam. Subsequently, residency programs are emphasizing clinical grades and the USMLE Step 2 Clinical Knowledge when screening and evaluating applicants.

### **No Residency, No Problem**

JABSOM does not have residency programs in neurosurgery, ophthalmology, otolaryngology, plastic surgery, urology, or vascular surgery. JABSOM students pursuing these specialties have limited access to faculty, residents, and research opportunities compared to medical students with home residency programs. Students should identify the JABSOM division chief in their specialty of interest as early as possible. It is also important to connect with physicians in the community through the division chief, student interest group, JABSOM Office of Student Affairs, Association of American Medical Colleges (AAMC) career night, or upper-level medical students.

Despite not having a home program or a formal research infrastructure, students can still engage in productive research and develop meaningful, long-term mentors. Medical students without a home otolaryngology program have gained mentors and conducted research through a local private practice group.<sup>28</sup> Alumni in the continental United States can also be resources for guidance and remote research opportunities. Internships during the summer between the first and second years of medical school and research years are viable options as well.

### **Diversity, Equity, and Inclusion**

Diversity in mentorship is an important factor in providing role models and attracting students from underrepresented backgrounds. Physicians from underrepresented groups are more likely to provide care to and have better patient satisfaction with underserved populations.<sup>29–33</sup> This is relevant, given the population of Native Hawaiians and other Pacific Islanders in Hawai'i and the health disparities that affect them.<sup>34–40</sup> Currently, there are discrepancies in the proportion of racial, ethnic, and gender minorities in surgery.<sup>41–46</sup> Barriers to surgical mentorship include lack of mentors, equity for underrepresented groups, and formal specialty exposure.<sup>47–49</sup> At JABSOM, the *Pū Pa 'akai* Native Hawaiian Tiered Mentoring Program pairs Native Hawaiian students with Native Hawaiian physicians in the specialty of interest.<sup>49</sup> JABSOM students may also seek national programs implemented to help students from

underrepresented backgrounds acquire well-connected mentors. For example, the Nth Dimensions, Perry Initiative, and Ruth Jackson Orthopaedic Society provide mentorship and opportunities for women and/or underrepresented minorities interested in orthopaedic surgery.<sup>50–53</sup> The American Academy of Otolaryngology-Head and Neck Surgery implemented mENTor, a program providing one-on-one mentorship to medical students interested in otolaryngology.<sup>54</sup> Students should keep in contact with these mentors for future opportunities, career guidance, and sponsorship.

### **Research Year**

Given the desire to make one's application more competitive, many students are utilizing a "research year" between the third and fourth years of medical school to develop mentors and advocates during a pivotal time in their career.<sup>2,55–62</sup> This can be either clinical or basic science (laboratory) research, although clinical research may be preferred due to the ability to complete more projects within a shorter timeframe.<sup>63,64</sup> The AAMC reported that the number of students taking a non-degree research year during medical school has more than doubled from 1995-2010.<sup>65</sup> An astounding 32% of students applying to orthopaedics pursue this option and the number of research year applicants has nearly doubled from 2014-2021.<sup>59</sup> These can be through formal programs or unpaid positions. In turn, research years are associated with an increased likelihood of matching into surgical specialties.<sup>61,62,66</sup> Egol et al found students who completed a research year matched into orthopaedics at a higher rate than those who did not complete a research year (91.0% vs. 67.9%).<sup>61</sup> Interactions through research activities provide mentors with more opportunity to get to know students and thus, advocate on their behalf.<sup>61</sup> Prior to committing, it is important students discuss the following with current and prior researchers: (1) financial implications (eg, travel, cost of living, stipends), (2) match success of prior researchers, (3) research productivity, and (4) the faculty they will be working with.

### **Who Is Giving Advice?**

Students may also find mentors in attendings, residents, and medical students. However, it is important for students to be cognizant regarding advice they are given. Career advising should be limited to physicians within that specialty or faculty who have access to historical data. With the transition of the USMLE Step 1 to pass/fail, addition of the supplemental residency application, and new ability for students to "signal" a limited number of residency programs that they're notably interested in when applying, physicians who are more "up-to-date" may be better equipped to advise students. Despite limited data and understanding regarding these implications, finding mentors who are, or know faculty who are, involved in the residency selection can provide students with better insight regarding their true competitiveness and how these changes will impact their application.

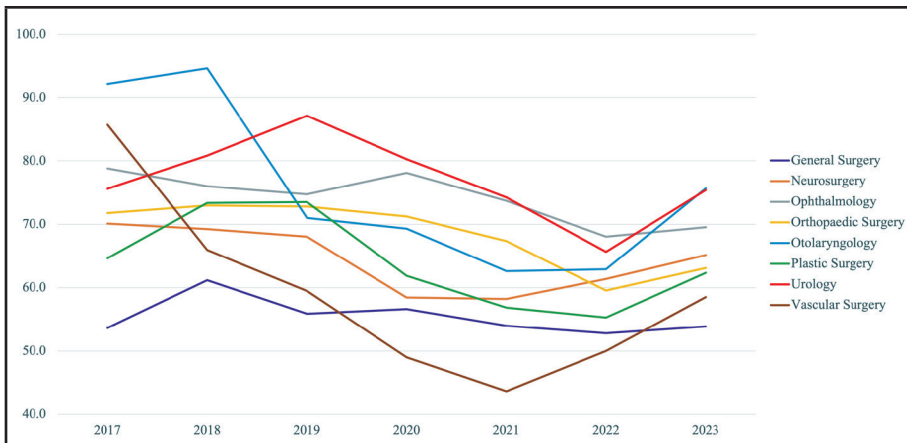


Figure 1. Percentage of Categorical Postgraduate Year-1 (PGY-1) Residency Positions to Applicants: 2017 to 2023

Table 1. Number of John A. Burns School of Medicine Students Matching into Surgical Specialties: 2017 to 2023

Specialty	2017	2018	2019	2020	2021	2022	2023	Total
General Surgery	8	5	7	3	5	2	7	37
Orthopaedic Surgery	0	2	1	3	0	3	5	14
Ophthalmology	1	0	4	1	1	2	2	11
Neurosurgery	1	0	0	0	2	2	0	5
Otolaryngology	1	0	0	0	0	0	3	4
Vascular Surgery	0	0	0	1	0	0	0	1
Urology	0	1	0	0	0	0	0	1
Plastic Surgery	0	1	0	0	0	0	0	1
Total	11	9	12	8	8	9	17	74

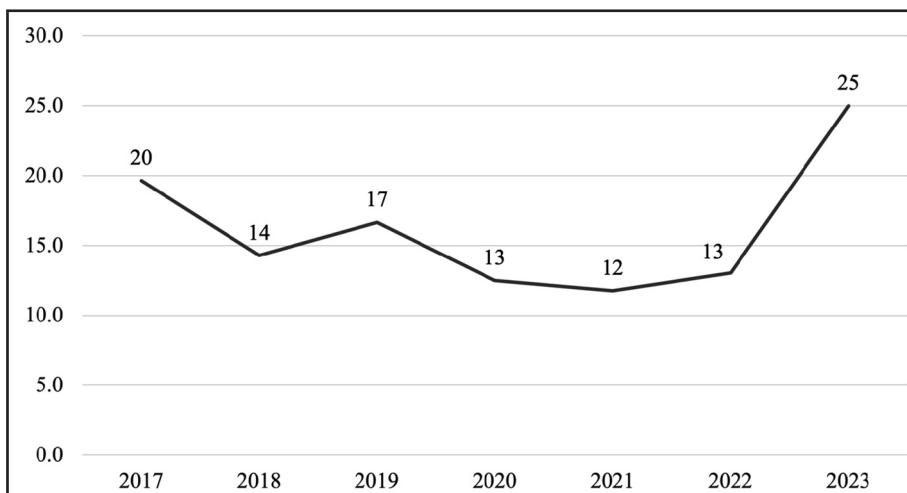


Figure 2. Percentage of John A. Burns School of Medicine Students Matching into a Surgical Specialty: 2017 to 2023

Residents can be a valuable resource and may be perceived as better clinical mentors than attendings due to greater interactions and relatability.<sup>67</sup> Residents can provide perspectives on programs, specialty insight, sub-internship guidance, research opportunities, and advocacy during selection. Medical students should identify which residents are equipped to offer advice aligned with their career goals. Strategies to consider include: (1) engaging upper-level residents, (2) asking which residents might provide useful advice, and (3) reaching out to recent JABSOM alumni.

Lastly, upper-level medical students can be valuable resources. Although their experience may be limited, they can offer personal experience through low-pressure relationships.<sup>68</sup> Upper-level medical students may become residents at mainland institutions and can broaden a student's network going forward.

### **Constructive Feedback**

One of the most important aspects of the mentor-student relationship is the ability to provide and receive constructive feedback. Faculty may feel limited in their ability to provide feedback due to concerns of retaliation and/or oversensitivity. Studies demonstrate that although student satisfaction is correlated with compliments, performance is correlated with constructive feedback.<sup>69</sup> Importantly, formal feedback sessions and Socratic teaching methods can be beneficial without decreasing clerkship enjoyment.<sup>70,71</sup> Medical students should be mindful that this is a learning opportunity, use this as motivation to improve, show appreciation, and be proactive to change behavior.<sup>2,72,73</sup>

Honest feedback is essential when discussing a student's candidacy for residency. To determine the student's likelihood of matching, the mentor should know the student's curriculum vitae, including standardized board scores, clinical grades, research, leadership, and awards. The mentor should highlight strengths and weaknesses of the student's profile, including potentially not being competitive for the specialty. This will set realistic expectations and provide time to strategize back-up plans. Conversely, if the mentors cannot discern the students' competitiveness, they may provide overly cautious advice to hedge a negative outcome. This includes taking a research year when it may not benefit the applicant or applying to more programs than necessary, both of which carry a significant financial burden. Given that the cost of application fees is based on the number of applications submitted, applications during the 2022-2023 academic year to 30 residency programs costed \$519, 75 programs \$1,689, and 100 programs \$2,339. Additionally, cautiously advising students to apply to many programs is fueled by game theory rather than success.<sup>74-76</sup>

### **Letter of Recommendation**

The duration and quality of the mentor-student relationship is important to provide contextual legitimacy to the letter of

recommendation (LOR).<sup>77,78</sup> Students who have spent an extended duration in multiple settings (eg, clinic, operating room, research) with their mentor may be perceived with more credibility than those who have spent limited time in a single setting. Additionally, mentors can provide a personalized narrative that speaks to the unique qualities of the student. Ideally, JABSOM students should seek letters from mentors within the specialty of interest. For example, neurosurgery recommends students seek letters from neurosurgery mentors, as non-neurosurgery mentors (ie, surgeons in other specialties) may not understand the unique challenges pertaining to neurosurgery residency.<sup>79</sup> Although receiving an outstanding letter from a well-known surgeon is ideal, this is not always feasible. An outstanding letter from a lesser-known mentor will be more favorable than a mediocre letter from a well-known chair/program director.

Surgical specialties have recently transitioned to a standardized LOR template to avoid the subjectivity with just a narrative LOR. However, concerns for grade inflation still exist.<sup>80-86</sup> Despite minor template variations between specialties, the overall goals are to (1) define the duration and quality of the mentor-student relationship, (2) place the student in a percentile within each evaluative domain, and (3) specify where the applicant will be ranked. Thus, engaging with mentors early in multiple settings may maximize favorable evaluations in all domains.

### **Sponsorship**

Sponsorship is a level above mentorship, in which mentors advocate on behalf of the student. This involves contacting programs to help the student receive a research opportunity, sub-internship, interview, or favorable rank list position. Students should update mentors regarding timelines, interviews, and their top choice residency program, as most sub-internships are offered on a rolling basis and rank lists are often made immediately after the last round of interviews.

### **Conclusion**

Quality, long-term mentorship is invaluable for JABSOM medical students pursuing surgical specialties. Establishing mentorship early can provide a reciprocal relationship for both the mentor and student. Various barriers exist that make acquiring quality mentorship challenging. However, there are various resources for students to find mentors both in Hawai'i and in the continental United States. Ultimately, mentorship can evolve into sponsorship, which students can leverage to gain advantage when matching into a surgical specialty.

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### **References**

1. Chen C. On the shoulders of giants. In: *Mapping Scientific Frontiers: The Quest for Knowledge Visualization*. Springer London; 2003:135-166. doi:10.1007/978-1-4471-0051-5\_5
2. Aiyer AA, Mody KS, Dib AG, et al. Medical student mentorship in orthopaedic surgery. *J Am Acad Orthop Surg*. 2021;29(16):681-690. doi:10.5435/JAAOS-D-20-01274



3. Match Data & Report Archives. National Resident Matching Program. Accessed April 5, 2023. <https://www.nrmp.org/match-data-analytics/archives/>
4. Urology and specialty matches. American Urological Association. Accessed April 4, 2023. <https://www.auanet.org/meetings-and-education/for-residents/urology-and-specialty-matches>
5. Statistics - Ophthalmology Residency. SF Match - Residency and Fellowship Matching Services. Accessed April 4, 2023. <https://sfmatch.org/specialty/ophthalmology-residency/Statistics>
6. Drusin LM, Gerber LM, Miller CH, Storey-Johnson CL, Ballard BL. An advisory program for first- and second-year medical students: the Weill Cornell experience. *Med Educ Online*. 2013;18:22684. doi:10.3402/meo.v18i0.22684
7. Sephien A, Hatch L, Karsch J, Hanna K, Kumar A, Gulick D. Prevalence of qualities and barriers associated with mentoring relationships from medical students' perspective: a multi-institutional cross-sectional study. *South Med J*. 2021;114(12):789-796. doi:10.14423/SMJ.0000000000001334
8. Andre C, Deerin J, Leykum L. Students helping students: vertical peer mentoring to enhance the medical school experience. *BMC Res Notes*. 2017;10(1):176. doi:10.1186/s13104-017-2498-8
9. DeFilippis E, Cowell E, Ruffin M, Sansone S, Kang Y. Innovative mentoring for female medical students. *Clin Teach*. 2016;13(5):381-382. doi:10.1111/tct.12408
10. Sobbing J, Duong J, Dong F, Grainger D. Residents as medical student mentors during an obstetrics and gynecology clerkship. *J Grad Med Educ*. 2015;7(3):412-416. doi:10.4300/JGME-D-14-00667.1
11. Rose GL, Rukstalis MR, Schuckit MA. Informal mentoring between faculty and medical students. *Acad Med J Assoc Am Med Coll*. 2005;80(4):344-348. doi:10.1097/00001888-200504000-00007
12. Murr AH, Miller C, Papadakis M. Mentorship through advisory colleges. *Acad Med J Assoc Am Med Coll*. 2002;77(11):1172-1173. doi:10.1097/00001888-200211000-00042
13. Fleming A, Cutrer W, Moutsos S, et al. Building learning communities: evolution of the colleges at Vanderbilt University School of Medicine. *Acad Med J Assoc Am Med Coll*. 2013;88(9):1246-1251. doi:10.1097/ACM.0b013e31829f8e2a
14. Oelschlagel AMA, Smith S, Tamura G, Carlisle J, Dobie S. Where do medical students turn? The role of the assigned mentor in the fabric of support during medical school. *Teach Learn Med*. 2011;23(2):112-117. doi:10.1080/10401334.2011.561664
15. Macaulay W, Mellman LA, Quest DO, Nichols GL, Haddad J, Puchner PJ. The advisory dean program: a personalized approach to academic and career advising for medical students. *Acad Med J Assoc Am Med Coll*. 2007;82(7):718-722. doi:10.1097/ACM.0b013e3180674af2
16. Indyk D, Deen D, Fornari A, Santos MT, Lu WH, Rucker L. The influence of longitudinal mentoring on medical student selection of primary care residencies. *BMC Med Educ*. 2011;11:27. doi:10.1186/1472-6920-11-27
17. Kman NE, Bernard AW, Khandelwal S, Nagel RW, Martin DR. A tiered mentorship program improves number of students with an identified mentor. *Teach Learn Med*. 2013;25(4):319-325. doi:10.1080/10401334.2013.827976
18. Neurosurgery mentorship program. NYU Langone Health. Accessed February 9, 2023. <https://med.nyu.edu/departments-institutes/neurosurgery/education/medical-student-training/mentorship-program>
19. Fricke TA, Lee MGY, Brink J, d'Udekem Y, Brizard CP, Konstantinov IE. Early mentoring of medical students and junior doctors on a path to academic cardiothoracic surgery. *Ann Thorac Surg*. 2018;105(1):317-320. doi:10.1016/j.athoracsur.2017.08.020
20. Behling F, Nasi-Kordhishti I, Haas P, Sandler J, Tatagiba M, Herlan S. One-on-one mentoring for final year medical students during the neurosurgery rotation. *BMC Med Educ*. 2021;21(1):229. doi:10.1186/s12909-021-02657-0
21. Sethia R, Sheehan CC, Danforth D, Essig G, Teknos TN, Elmaraghy CA. ENT mentorship program for preclinical medical students. *Otolaryngol Neck Surg*. 2020;163(2):198-203. doi:10.1177/0194599819900261
22. Cloyd J, Holtzman D, O'Sullivan P, Sammann A, Tendick F, Ascher N. Operating room assist: surgical mentorship and operating room experience for preclerkship medical students. *J Surg Educ*. 2008;65(4):275-282. doi:10.1016/j.jsurg.2008.04.002
23. Barker JC, Rendon J, Janis JE. Medical student mentorship in plastic surgery: the mentee's perspective. *Plast Reconstr Surg*. 2016;137(6):1934-1942. doi:10.1097/PRS.0000000000002186
24. Pre-op program. Weill Cornell Medicine Medical College. Accessed February 9, 2023. <https://medicaleducation.weill.cornell.edu/medical-education/pre-op-program>
25. Janis JE, Barker JC. Medical student mentorship in plastic surgery: the mentor's perspective. *Plast Reconstr Surg*. 2016;138(5):925e-935e. doi:10.1097/PRS.0000000000002670
26. ElHawary H, Salimi A, Gorgy A, Fesdekjan L, Seal A, Gilardino MS. Medical student mentorship in surgery: lessons learnt and future directions. *J Surg Educ*. 2022;79(1):129-138. doi:10.1016/j.jsurg.2021.07.013
27. Brook EM, Hu CH, Li X, Smith EL, Matzkin EG. The influence of mentors in orthopedic surgery. *Orthopedics*. 2020;43(1):e37-e42. doi:10.3928/01477447-20191122-02
28. Ramirez AV, Espinoza V, Ojeaga M, Garza A, Hensler B, Honrubia V. Home away from home: mentorship and research in private practices for students without home programs. *Otolaryngol Head Neck Surg*. Published online August 1, 2022:1945998221120231. doi:10.1177/01945998221120231
29. Marrast LM, Zallman L, Woolhandler S, Bor DH, McCormick D. Minority physicians' role in the care of underserved patients: diversifying the physician workforce may be key in addressing health disparities. *JAMA Intern Med*. 2014;174(2):289-291. doi:10.1001/jamainternmed.2013.12756
30. Arvizu C, Garrison E. Diversity and Inclusion: The role of unconscious bias on patient care, health outcomes and the workforce in obstetrics and gynaecology. *Curr Opin Obstet Gynecol*. 2019;31(5):356-362. doi:10.1097/GCO.0000000000000566
31. Brotherton SE, Stoddard JJ, Tang SS. Minority and nonminority pediatricians' care of minority and poor children. *Arch Pediatr Adolesc Med*. 2000;154(9):912-917. doi:10.1001/archpedi.154.9.912
32. Komaromy M, Grumbach K, Drake M, et al. The role of black and Hispanic physicians in providing health care for underserved populations. *N Engl J Med*. 1996;334(20):1305-1310. doi:10.1056/NEJM199605163342006
33. Lloyd SM, Johnson DG. Practice patterns of black physicians: results of a survey of Howard University College of Medicine Alumni. *J Natl Med Assoc*. 1982;74(2):129-141.
34. Mau MK, Sinclair K, Saito EP, Baumhofer KN, Kaholokula JK. Cardiometabolic health disparities in Native Hawaiians and Other Pacific Islanders. *Epidemiol Rev*. 2009;31:113-129. doi:10.1093/ajrev/mxp004
35. Bacong AM, Holub C, Porotesano L. Comparing obesity-related health disparities among Native Hawaiians/Pacific Islanders, Asians, and whites in California: reinforcing the need for data disaggregation and operationalization. *Hawaii J Med Public Health*. 2016;75(11):337-344.
36. Obana KK, Davis J. Racial disparities in the prevalence of arthritis among Native Hawaiians and Pacific Islanders, whites, and Asians. *Hawaii J Med Public Health*. 2016;75(6):155-161.
37. Nakagawa K, Koenig MA, Seto TB, Asai SM, Chang CW. Racial disparities among Native Hawaiians and Pacific Islanders with intracerebral hemorrhage. *Neurology*. 2012;79(7):675-680. doi:10.1212/WNL.0b013e3182608c6f
38. Kamaka ML, Watkins-Victorino L, Lee A, et al. Addressing Native Hawaiian and Pacific Islander data deficiencies through a community-based collaborative response to the COVID-19 pandemic. *Hawaii J Health Soc Welf*. 2021;80(10 Suppl 2):36-45.
39. Penaia CS, Morey BN, Thomas KB, et al. Disparities in Native Hawaiian and Pacific Islander COVID-19 mortality: a community-driven data response. *Am J Public Health*. 2021;111(S2):S49-S52. doi:10.2105/AJPH.2021.306370
40. Tapparra K, Qu V, Pollom E. Disparities in survival and comorbidity burden between Asian and Native Hawaiian and other Pacific Islander patients with cancer. *JAMA Netw Open*. 2022;5(8):e2226327. doi:10.1001/jamanetworkopen.2022.26327
41. Figure 26. Primary care versus nonprimary care physicians by race/ethnicity, 2018. AAMC. Accessed February 9, 2023. <https://www.aamc.org/data-reports/workforce/interactive-data/figure-26-primary-care-versus-nonprimary-care-physicians-race/ethnicity-2018>
42. Vemulakonda VM, Sorensen MD, Joyner BD. The current state of diversity and multicultural training in urology residency programs. *J Urol*. 2008;180(2):668-672. doi:10.1016/j.juro.2008.04.030
43. Day CS, Lage DE, Ahn CS. Diversity based on race, ethnicity, and sex between academic orthopaedic surgery and other specialties: a comparative study. *J Bone Joint Surg Am*. 2010;92(13):2328-2335. doi:10.2106/JBJS.I.01482
44. Gabriel PJ, Alexander J, Karkliņa A. Diversity in neurosurgery: trends in gender and racial/ethnic representation among applicants and residents from U.S. neurological surgery residency programs. *World Neurosurg*. 2021;150:e305-e315. doi:10.1016/j.wneu.2021.02.127
45. Smith JB, Chiu AG, Sykes KJ, Eck LP, Hierl AN, Villwock JA. Diversity in academic otolaryngology: an update and recommendations for moving from words to action. *Ear Nose Throat J*. 2021;100(10):702-709. doi:10.1177/01455661320922633
46. Xierali IM, Nivet MA, Wilson MR. Current and future status of diversity in ophthalmologist workforce. *JAMA Ophthalmol*. 2016;134(9):1016-1023. doi:10.1001/jamaophthalmol.2016.2257
47. Entezami P, Franzblau LE, Chung KC. Mentorship in surgical training: a systematic review. *Hand N Y N*. 2012;7(1):30-36. doi:10.1007/s11552-011-9379-8
48. O'Connor MI. Medical school experiences shape women students' interest in orthopaedic surgery. *Clin Orthop*. 2016;474(9):1967-1972. doi:10.1007/s11999-016-4830-3
49. Mau M, Chun MBJ. Mentoring as a means to achieving workforce diversification in orthopaedic surgery. *Hawaii J Health Soc Welf*. 2023;82(2):50-52.
50. Lattanza LL, Meszaros-Deoroff L, O'Connor MI, et al. The Perry Initiative's medical student outreach program recruits women into orthopaedic residency. *Clin Orthop*. 2016;474(9):1962-1966. doi:10.1007/s11999-016-4908-y
51. Samora JB, Russo C, LaPorte D. Ruth Jackson Orthopaedic Society: Promoting women in orthopaedics. *J Am Acad Orthop Surg*. 2022;30(8):364-368. doi:10.5435/JAAOS-D-21-00956
52. Vajapey S, Cannada LK, Samora JB. What proportion of women who received funding to attend a Ruth Jackson Orthopaedic Society meeting pursued a career in orthopaedics? *Clin Orthop*. 2019;477(7):1722-1726. doi:10.1097/CORR.0000000000000720
53. Mason B, Ross WAJ, Bradford L. Nth Dimensions evolution, impact, and recommendations for equity practices in orthopaedics. *J Am Acad Orthop Surg*. 2022;30(8):350-357. doi:10.5435/JAAOS-D-21-01189
54. Adolpho N. Mentorship program. American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS). Accessed February 9, 2023. <https://www.entnet.org/get-involved/student-programs/physician-observership-program/>
55. Pathipati AS, Taleghani N. Research in medical school: a survey evaluating why medical students take research years. *Cureus*. 8(8):e741. doi:10.7759/cureus.741
56. Svider PF, Husain Q, Mauro KM, Folbe AJ, Baredes S, Eloy JA. Impact of mentoring medical students on scholarly productivity. *Int Forum Allergy Rhinol*. 2014;4(2):138-142. doi:10.1002/alr.21247
57. Bram JT, Pirruccio K, Aoyama JT, Ahn J, Ganley TJ, Flynn JM. Do year-out programs make medical students more competitive candidates for orthopedic surgery residencies? *J Surg Educ*. 2020;77(6):1440-1449. doi:10.1016/j.jsurg.2020.05.008
58. Wright-Chisem J, Cohn MR, Yang J, Osei D, Kogan M. Do medical students who participate in a research gap year produce more research during residency? *J Am Acad Orthop Surg Glob Res Rev*. 2021;5(5). doi:10.5435/JAAOSGlobal-D-21-00061
59. Cotter EJ, Polce EM, Lee E, et al. Incidence of research gap years in orthopaedic residency applicants: the new standard? *J Am Acad Orthop Surg Glob Res Rev*. 2021;5(11):e21.00247. doi:10.5435/JAAOSGlobal-D-21-00247
60. Wadhwa H, Shah SS, Shan J, et al. The neurosurgery applicant's "arms race": analysis of medical student publication in the neurosurgery residency match. *J Neurosurg*. Published online November 1, 2019:1-9. doi:10.3171/2019.8.JNS.191256
61. Egol KA, Shields CN, Errico T, et al. A focused gap year program in orthopaedic research: an 18-year experience. *J Am Acad Orthop Surg*. 2020;28(14):e620-e625. doi:10.5435/JAAOS-D-19-00424
62. Clark SC, Brown SM, Mulcahey MK. Gap year research fellowship opportunities for medical students interested in orthopaedic surgery. *J Am Acad Orthop Surg Glob Res Rev*. 2021;5(12):e21.00153. doi:10.5435/JAAOSGlobal-D-21-00153
63. Golub D. Planning a research year when applying to neurosurgery. MSNTC. Accessed April 27, 2023. <http://www.neurosurgerytraining.org/3/post/2020/04/planning-a-research-year-when-applying-to-neurosurgery.html>

64. Cohen-Gadol A. Conducting and presenting research. The Neurosurgical Atlas. Accessed April 27, 2023. <https://www.neurosurgicalatlas.com/volumes/medical-student-guide-for-matching-in-neurosurgery/conducting-and-presenting-research>
65. Graduation rates and attrition factors for U.S. medical school students. *Am Assoc Med Coll AAMC*. 2014;14(5). <http://www.aamc.org/download/379220/data/may2014aib-graduationrate-sandattritionfactorsforusmedschools.pdf>
66. Mehta K, Sinno S, Thanik V, Weichman K, Janis JE, Patel A. Matching into integrated plastic surgery: the value of research fellowships. *Plast Reconstr Surg*. 2019;143(2):640-645. doi:10.1097/PRS.0000000000005212
67. Nguyen SQ, Divino CM. Surgical residents as medical student mentors. *Am J Surg*. 2007;193(1):90-93. doi:10.1016/j.amjsurg.2006.07.011
68. Nimmons D, Giny S, Rosenthal J. Medical student mentoring programs: current insights. *Adv Med Educ Pract*. 2019;10:113-123. doi:10.2147/AMEP.S154974
69. Boehler ML, Rogers DA, Schwind CJ, et al. An investigation of medical student reactions to feedback: a randomised controlled trial. *Med Educ*. 2006;40(8):746-749. doi:10.1111/j.1365-2929.2006.02503.x
70. Garner MS, Gusberg RJ, Kim AW. The positive effect of immediate feedback on medical student education during the surgical clerkship. *J Surg Educ*. 2014;71(3):391-397. doi:10.1016/j.jsurg.2013.10.009
71. Markman JD, Soepronon TM, Combs HL, Cosgrove EM. Medical student mistreatment: understanding 'public humiliation.' *Med Educ Online*. 2019;24(1):1615367. doi:10.1080/10872981.2019.1615367
72. Hardavella G, Aamli-Gaagnat A, Saad N, Rousalova I, Sreter KB. How to give and receive feedback effectively. *Breathe*. 2017;13(4):327-333. doi:10.1183/20734735.009917
73. Levine WN, Braman JP, Gelberman RH, Black KP. Mentorship in orthopaedic surgery-road map to success for the mentor and the mentee: American Orthopaedic Association critical issue. *J Bone Joint Surg Am*. 2013;95(9):e59. doi:10.2106/JBJS.L.01047
74. Finkler ES, Fogel HA, Kroin E, et al. Factors influencing the number of applications submitted per applicant to orthopedic residency programs. *Med Educ Online*. 2016;21(1):31865. doi:10.3402/meo.v21.31865
75. Li NY, Gruppuso PA, Kalagara S, Eitorai AEM, DePasse JM, Daniels AH. Critical assessment of the contemporary orthopaedic surgery residency application process. *J Bone Joint Surg Am*. 2019;101(21):e114. doi:10.2106/JBJS.18.00587
76. Putnam-Pite D. Viewpoint from a former medical student/now intern playing the game-balancing numbers and intangibles in the orthopedic surgery match. *J Grad Med Educ*. 2016;8(3):311-313. doi:10.4300/JGME-D-16-00236.1
77. Nguyen AT, Janis JE. Resident selection protocols in plastic surgery: a national survey of plastic surgery independent program directors. *Plast Reconstr Surg*. 2012;130(2):459-469. doi:10.1097/PRS.0b013e318258d4dd
78. Results of the 2020 National Residency Matching Program Director Survey. National Resident Matching Program, Washington, DC. Published online 2020. Accessed August 20, 2021. <https://www.nrmpp.org/wp-content/uploads/2022/01/2020-PD-Survey.pdf>
79. Letters of recommendation. NeurosurgeryMatch.org. Accessed February 9, 2023. <https://www.neurosurgerymatch.org/application-process/letters-of-recommendation/>
80. Feldman MJ, Ortiz AV, Roth SG, et al. An examination of standardized letters of recommendation rating scales among neurosurgical residency candidates during the 2020-2021 application cycle. *Neurosurgery*. 2021;89(6):1005-1011. doi:10.1093/neuros/nyab346
81. Kang HP, Robertson DM, Levine WN, Lieberman JR. Evaluating the standardized letter of recommendation form in applicants to orthopaedic surgery residency. *J Am Acad Orthop Surg*. 2020;28(19):814-822. doi:10.5435/JAAOS-D-19-00423
82. Reghunathan M, Carbullido MK, Blum J, Wong S, Gosman AA. Standardized letters of recommendation in plastic surgery: the impact of gender and race. *Plast Reconstr Surg*. 2022;149(5):1022e-1031e. doi:10.1097/PRS.0000000000008991
83. Nabavizadeh B, Hakam N, Sadighian MJ, et al. Characterizing standardized letters of recommendation in urology residency applications. *Urology*. 2021;158:18-25. doi:10.1016/j.urology.2021.06.051
84. Pacana MJ, Thier ZT, Jackson JB, Koon DE, Grabowski G. More than one-third of orthopaedic applicants are in the top 10%: the standardized letter of recommendation and evaluation of orthopaedic resident applicants. *Clin Orthop*. 2021;479(8):1703-1708. doi:10.1097/CORR.0000000000001707
85. Kimple AJ, McClurg SW, Del Signore AG, Tomoum MO, Lin FC, Senior BA. Standardized letters of recommendation and successful match into otolaryngology. *The Laryngoscope*. 2016;126(5):1071-1076. doi:10.1002/lary.25637
86. Inclan PM, Cooperstein AA, Powers A, Dy CJ, Klein SE. When (almost) everyone is above average. *JBJS Open Access*. 2020;5(3):e20.00013. doi:10.2106/JBJS.OA.20.00013

# UNIVERSITY OF HAWAI‘I CANCER CENTER CONNECTION

## Overview of the Oncology Landscape in Hawai‘i and Introduction to the New University of Hawai‘i Cancer Center Director

Shane Y. Morita MD, PhD, FACS

The Cancer Center Connection is a standing column from the University of Hawai‘i Cancer Center and is edited by HJH&SW Contributing Editor Shane Y. Morita MD, PhD, FACS.

### Introduction

This year in Hawai‘i, it is estimated that nearly 8500 residents will be diagnosed with cancer and over 2500 patients will die of this disease.<sup>1</sup> While the numbers may pale in comparison to other states, Hawai‘i is tasked with distinct challenges. It possesses the most diverse population in the country and is the only state in the nation composed entirely of islands. It is located in the center of the Pacific Basin and thus is a referral hub for tertiary care. Although heart disease is the most common cause of overall death in the United States, in Asian men and women, cancer is the leading cause of mortality; additionally, Native Hawaiian/Pacific Islander females die of cancer more than any other condition.<sup>2</sup> These multi-ethnic disparities and geographic barriers place Hawai‘i in a compelling situation for the fight against cancer, both from a clinical as well as a scientific standpoint.

The World Health Organization director general, Tedros Adhanom Ghebreyesus stated on May 5, 2023, “With great hope, I declare COVID-19 over as a global health emergency.”<sup>3</sup> Although the pandemic is waning, provider shortages are also becoming more apparent for those with cancer, especially on the neighbor islands. Creating more research infrastructure and expanding clinical trials will promote more opportunities for patients to receive innovative therapy without leaving the state. With that impetus, the importance of the University of Hawai‘i Cancer Center has become magnified. It is the only National Cancer Institute designated Cancer Center in the Pacific and has held this distinction since 1996. It conducts world-class research and has been a fixture on campus in the Kaka‘ako neighborhood on the island of Oahu since 2013. Strengthening existing partnerships and building new collaborations will be paramount in order to reduce the hardship created by cancer. The Hawai‘i Cancer Consortium is led by the University of Hawai‘i (UH) Cancer Center and members include: Adventist Health Castle, Hawai‘i Medical Service Association, Hawai‘i Pacific Health, Kuakini Medical Center, The Queen’s Health System, and UH Mānoa’s John A. Burns School of Medicine.

Dr. Naoto Ueno took the helm of the UH Cancer Center as its director on December 12, 2022. He is not only a medical oncologist and scientist but also a cancer survivor. He received his MD from Wakayama Medical College of Japan and obtained his PhD in Cancer Biology from The University of Texas Graduate School of Biomedical Sciences. He performed his Clinical Residency in Internal Medicine at the University of Pittsburgh Medical Center and Clinical Fellowship in Medical Oncology and Blood and Marrow Transplantation at the University of Texas MD Anderson Cancer Center. In addition to being the Director of the University of Hawai‘i Cancer Center, he is also Interim Program Co-Leader, Cancer Biology and Therapeutic Program, University of Hawai‘i Cancer Center as well as Full Member, Cancer Biology and Therapeutic Program (Translational and Clinical Research), University of Hawai‘i Cancer Center. His academic appointments include being Professor (Researcher), University of Hawai‘i Cancer Center, University of Hawai‘i at Mānoa as well as Professor, Department of Medicine, John A. Burns School of Medicine, University of Hawai‘i at Mānoa.

In my recent conversation with him, he indicated that his mission is “to bring inclusivity and expand our workforce’s diversity, ultimately leading to innovation and productivity.” He is the first Asian who has held this post in Hawai‘i. He and his wife enjoy the culture of Hawai‘i and became interested in relocating from Texas when an opportunity presented itself. He is fully aware of the need to pursue funding externally including exploring governmental and philanthropic initiatives.

I asked him 3 principal questions that centered on short-term, intermediate, and long-term goals.

### Short-term Goal

Launch an early phase clinical trial unit which will allow patients to receive more novel therapies in Hawai‘i. Dr. Ueno would like to see this operationalized within the next 1.5 years and feels this will provide added value to what is already offered in the state.

## Intermediate Goal

Establish a medical oncology fellowship in 5 years to encourage oncology specialists to remain in Hawai'i and provide a platform for them to care for cancer patients. Dr. Ueno is a strong advocate for education and enjoys teaching and mentoring.

## Long-term Goal

Be widely regarded for our high-quality clinical care as well as research and create a strong connection with Asia. Dr. Ueno has a formidable desire to be impactful not only locally, but regionally and, eventually, internationally.

In the succeeding months after our meeting this spring, he has already interfaced with many community stakeholders and health system leaders and is fostering relationships within the Hawai'i Cancer Consortium. He has also initiated dialogue with other organizations including the Hawai'i Society of Clinical Oncology, where he is proposing educational seminars. He acknowledged that some of these activities occurred before his arrival but emphasized that it is a priority of the University of Hawai'i Cancer Center to keep engagement high amongst everyone. He also sees the John A. Burns School of Medicine as a resource for forming an Oncology Division.

## Conclusion

Cancer care in Hawai'i is complex given the diverse population and geographic isolation. Although the pandemic is waning, cancer patients throughout the state are still facing barriers. Therefore, it is imperative that existing partnerships are strengthened, and new relationships are developed with the University of Hawai'i Cancer Center in order to promote the greatest chance to deliver the most appropriate trial. With the vision of new leadership, it is optimistic that Dr. Ueno and his team will achieve the goals that were declared at the outset.

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### References

1. American Cancer Society. Cancer Facts & Figures 2023. Atlanta: American Cancer Society; 2023.
2. Heron M. Deaths: Leading causes for 2018. National Vital Statistics Reports; vol 70 no 4. Hyattsville, MD: National Center for Health Statistics. 2021. doi.org/10.15620/cdc:104186
3. World Health Organization. WHO Director-General's opening remarks at the media briefing – 5 May 2023. Published May 5, 2023. Accessed May 12, 2023. <https://www.who.int/news-room/speeches/item/who-director-general-s-opening-remarks-at-the-media-briefing--5-May-2023>

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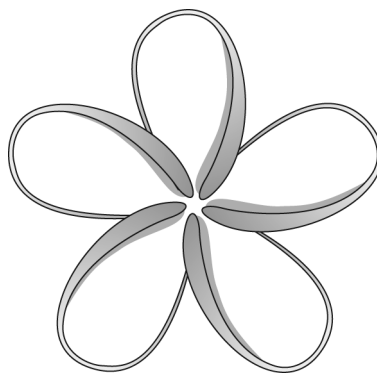
### **A Qualitative Study on Preventing Gestational Diabetes in Native Hawaiian and Pacific Islander Adolescent Females: Perspectives from an Expert Panel of Health Care Providers**

In: Stotz SA, Soon R, Moore KR, et al. A Qualitative Study on Preventing Gestational Diabetes in Native Hawaiian and Pacific Islander Adolescent Females: Perspectives from an Expert Panel of Health Care Providers. *Hawaii J Health Soc Welf*. 2023;82(1):10-15.

When originally published, an author's name was left out of the list of authors in the manuscript. The name "Reni Soon" should be added as second author.

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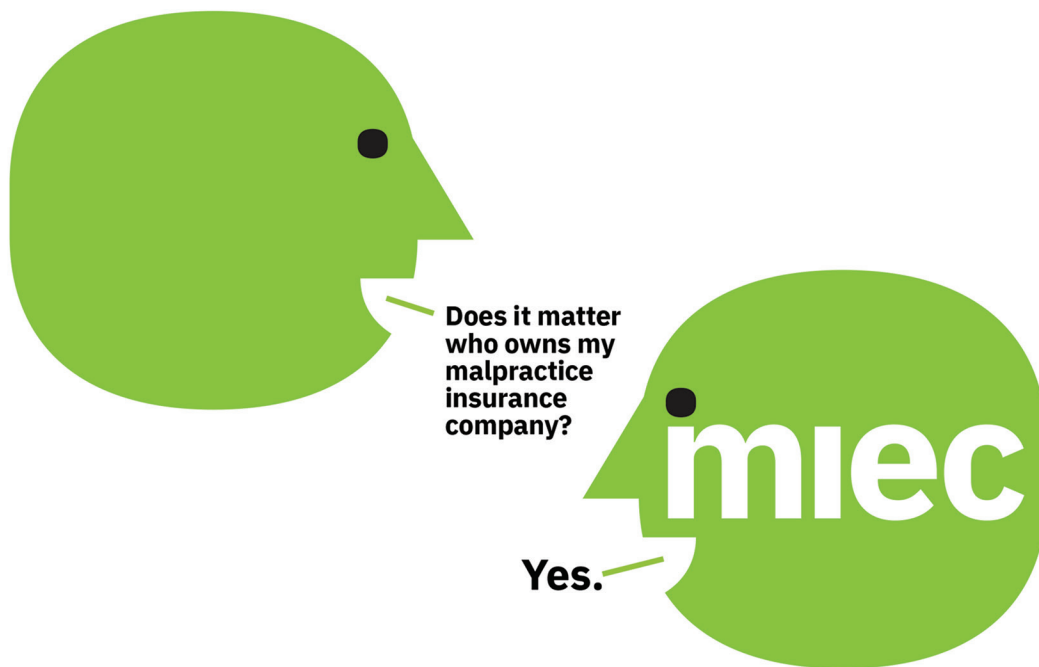
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