

Hawai‘i Journal of Medicine & Public Health

A Journal of Pacific Medicine & Public Health

March 2017, Volume 76, No. 3, ISSN 2165-8218

PERCEPTIONS OF FACTORS IMPACTING LONGEVITY AMONG HAWAI‘I OLDER ADULTS 71

Michiyo Tomioka PhD; Kathryn Braun DrPH; Mieko Homma PhD; Hiroaki Nobuhara PhD; Tomio Kubota PhD and Hiromichi Sakai MS

HIGH SCHOOL FOOTBALL PLAYERS USE THEIR HELMETS TO TACKLE OTHER PLAYERS DESPITE KNOWING THE RISKS 77

Andrew M. Kuriyama MPH; Austin S. Nakatsuka MD; Loren G. Yamamoto MD, MPH, MBA

THE WANDERING WOMAN: A CASE STUDY OF CATATONIA VS FACTITIOUS DISORDER 82

Jennifer W.H. Wong MD and Steven R. Williams MD

MEDICAL SCHOOL HOTLINE 85

Graduate Certificate in Tropical Medicine

William L. Gosnell PhD and Kenton Kramer PhD

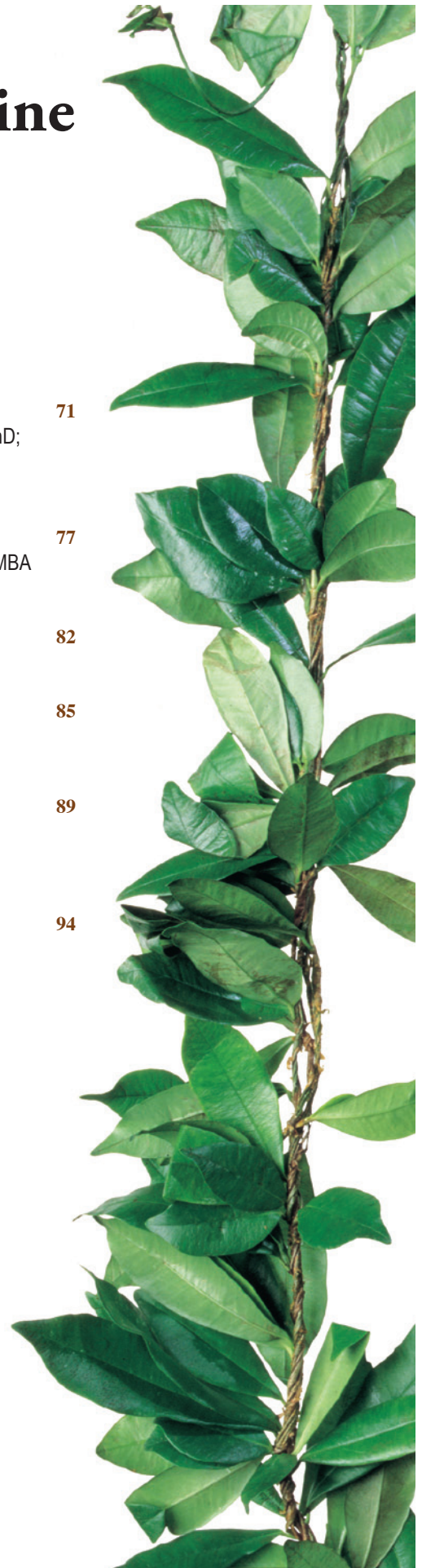
INSIGHTS IN PUBLIC HEALTH 89

Training Today’s Students to Meet Tomorrow’s Challenges: Undergraduate Public Health at the University of Hawai‘i at Manoa

Denise C. Nelson-Hurwitz PhD; Lee-Ann Arakaki MS; and Maya Uemoto MPH

THE WEATHERVANE 94

Russell T. Stodd MD



Hawai'i Journal of Medicine & Public Health

A Journal of Pacific Medicine & Public Health

ISSN 2165-8218 (Print), ISSN 2165-8242 (Online)

The Journal's aim is to provide new scientific information in a scholarly manner, with a focus on the unique, multicultural, and environmental aspects of the Hawaiian Islands and Pacific Rim region.

Published by University Clinical, Education & Research Associates (UCERA)

Hawai'i Journal of Medicine & Public Health
677 Ala Moana Blvd., Suite 1016B
Honolulu, Hawai'i 96813
<http://www.hjmph.org>; Email: info@hjmph.org

The Hawai'i Journal of Medicine & Public Health was formerly two separate journals: The Hawai'i Medical Journal and the Hawai'i Journal of Public Health. The Hawai'i Medical Journal was founded in 1941 by the Hawai'i Medical Association (HMA), which was incorporated in 1856 under the Hawaiian monarchy. In 2009 the journal was transferred by HMA to University Clinical, Education & Research Associates (UCERA). The Hawai'i Journal of Public Health was a collaborative effort between the Hawai'i State Department of Health and the Office of Public Health Studies at the John A. Burns School of Medicine established in 2008.

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Perceptions of Factors Impacting Longevity among Hawai'i Older Adults

Michiyo Tomioka PhD; Kathryn Braun DrPH; Mieko Homma PhD; Hiroaki Nobuhara PhD; Tomio Kubota PhD and Hiromichi Sakai MS

Abstract

With increased life expectancy, people need more education about healthy aging. This paper examines older adult perceptions regarding various factors impacting longevity, including genetics, lifestyle, and the environment. Data were collected from 733 Hawai'i adults age 50 years and older (39% Caucasian, 27% Japanese, 19% Native Hawaiian and Pacific Islander (NHOP), 9% Chinese, and 7% Filipino) through randomized telephone interviews. Participants were asked to rate a variety of factors as having "great impact," "some impact," or "no impact" on lifespan. Regardless of ethnicity, more than half of the participants felt that eating habits, exercise, health information, health care, and the environment had great impact on lifespan. Less than half felt that economic status and community had great impact. Compared to the all ethnic groups, Filipino respondents were significantly less likely to feel that smoking (44%, compared with an average across all race/ethnicities of 64%) and stress (48%, average 62%) had great impact. Chinese participants were more likely to feel that drinking alcohol (64%) had great impact (average 38%). Filipinos and Chinese were more likely to perceive that working conditions have great impact (65% and 56%, respectively; average 45%), and NHOP and Filipinos were more likely to perceive the natural environment as having great impact (59% and 54%, respectively; average 46%). Findings suggest that cultural values and experiences may shape older adults' perceptions of factors associated with lifespan, providing guidance for health professionals on how to tailor health messages to older adults in different ethnic groups.

Keywords

Lifespan/impact on lifespan, minority, health education

Introduction

Life expectancy is increasing across the United States (US) and in Hawai'i. With increased life expectancy, people need more education about healthy aging. But what do older adults know about factors that influence longevity and health? In Hawai'i, a multicultural state, it is useful to assess the health beliefs of different ethnic groups because life expectancy varies dramatically by ethnic group. For example, in 2010, life expectancy at birth was 79 years for males and 86 years for females. However, there was also a 10-year gap in life expectancy between Native Hawaiians (77 years), the shortest living group, and Chinese (88 years), the longest living group, in Hawai'i.¹

Longitudinal studies and research on extremely long-lived individuals, including centenarians, provide insights into the predictors of longevity such as genetics, income, education, familial environment, lifestyle behaviors, and mental health. For example, in an analysis of centenarians and matched controls, paternal and maternal longevity were predictors of long life for both men and women, highlighting the important role of genetics.² In terms of lifestyle, findings from the Oslo Ischemia Study suggest that smoking status is significantly and independently related to longevity. This study also found that, among non-smokers, overweight and physical fitness are significantly and

independently related to longevity after adjusting for age, blood pressure, and cholesterol level.³ Findings from the Honolulu Asia Aging Study (HAAS) suggest that avoidance of overweight, hyperglycemia, hypertension, smoking, and excessive alcohol consumption are associated with overall and exceptional (over 85 years of age) survival.⁴

Individual socio-economic status also is important. For example, an analysis of a merged tax-record-death-record database found that higher income was associated with greater longevity across the US.⁵ Also, the aforementioned HAAS study found that high educational attainment was associated with exceptional survival.⁴

Stress and mental health status may also be important for longevity. For example, analysis of data from the Health Survey for England found a dose response between psychological distress and increased mortality.⁶ The HAAS study found that otherwise disease-free men reporting depressive symptoms had higher mortality than healthy men without depressive symptoms.⁷ Longitudinal research in Canada suggests that mortality risk increases for people with a high level of distrust in others, belief that the world is an unjust place, and a pessimistic view of their opportunities in the future.⁸

Life expectancy is also associated with one's occupation. For example, it is estimated that 10%–38% of the variation in life expectancy across demographic groups can be attributed to the working conditions the groups experience.⁹ It also is influenced by community characteristics. A study comparing 30 counties, Organization for Economic Co-operation and Development (OECD), identified urbanization and number of hospitals per capita as associated with life expectancy.¹⁰ The Diet and Health Study of the National Institutes of Health–American Association of Retired Persons (NIH-AARP), examined the socioeconomic of census tracts and found that risk of premature mortality among healthy adults was associated with neighborhood socioeconomic inequality.¹¹

Media and public health professionals have attempted to disseminate research findings on factors influencing health and longevity. However, it is not known how much of this information has been absorbed by older adults, nor is it known the extent to which these factors are recognized as important by different ethnic groups. Understanding individual and group perceptions of health risk will help in the development and targeting of health promotion messages. In fact, knowledge of health risks is a key construct in many behavior change theories, including the Health Belief Model, the Social-Cognitive Model, the Transtheoretical Model, and the Theory of Planned Behavior.¹²

This paper describes similarities and differences of older adults' perceptions, across five ethnic groups in Hawai'i of impact of various factors on longevity, including genetics, lifestyle, and the environment.

Methods

Data were collected as part of a collaboration between the University of Hawai'i (UH) and Saitama Prefectural University in Saitama, Japan. The latter institution is collecting health belief and behavior data in several cities in Japan, China, Korea, Taiwan, and Hawai'i. In Honolulu, data were collected in 2015 from 1,266 adults age 18 years and older through random-digital, computer-assisted telephone interview (CATI). The survey team used dual-frame sampling that included both landlines and cell-phones. Several attempts were made to contact a resident, and when the resident did not meet the age eligibility, the interviewer called back at an appropriate time to reach an eligible resident at the household.

This paper reports findings on 733 Hawai'i adults in the sample who were age 50 years and older. We limited this analysis to older adults for several reasons. First, nearly 73% of adults age 50 and older have at least one chronic condition.¹³ Second, older people are more aware of their health than younger people because of the increase in recommended health screening after age 50.¹⁴ Third, the age distribution of the full sample was dissimilar across ethnic groups, and some ethnic groups had higher proportion of young adults who may have much different health beliefs than older adults. Thus, we limited this analysis to the oldest age group—adults 50+.

The data collection instrument was provided by Saitama Prefectural University based on their interests in health knowledge and behaviors across East Asia and Hawai'i. Several rounds of pretesting with UH public health students and Hawai'i residents helped assure that the English-language version of the questionnaire was understandable to Hawai'i adults. The questionnaire included a total of 99 items on self-rated health, lifestyle behaviors (eg, smoking, drinking alcohol, and exercising), diet (eg, limiting the amount of salt and sugar and eating specific healthy foods), health-seeking behavior, social support, stress, health conditions, BMI (height and weight), and demographics.

This analysis focuses on one section of the questionnaire that asked about factors that impacted longevity. The interviewer read this introduction: "I am going to read several factors that could impact how long you live. Please tell me what impact each factor has on your lifespan." The 13 queried factors included eating habits, exercise, knowledge about health, stress, drinking alcohol, smoking, genetics, personal economic status, healthcare access, working conditions, home environment, community, and natural environment. Response options were "great impact," "some impact," and "no impact." For purposes of this analysis, responses were dichotomized to great impact vs some or no impact.

Data were managed and analyzed in IBM SPSS V23.0 Armonk, NY. Chi-square tests were used to compare differences by ethnic group in the percentage of individuals who felt each

factor had great impact on lifespan. To standardize reporting, data are reported for groups with higher prevalence first, followed by those with a lower prevalence.

Results

Demographic

Of the 733 participants included in this analysis, 39% were Caucasian, 27% were Japanese, 19% were NHOPI, 9% were Chinese, and 7% were Filipino. The mean age of participants was 65.3 years, with slight variations in mean age by ethnic group (Japanese=66.5, range 50-93; Caucasian=65.9, range 50-96; Chinese=64.4, range 50-96; Filipino=64.0, range 51-89; and NHOPI=63.2, range 50-87; [$P=.013$]). As shown in Table 1, there were slightly more female respondents than male respondents in the sample, but the distribution of male and female across ethnic groups did not differ significantly ($P=.923$). More than half of participants were married (average was 59%), and 72% reported their living standard as "middle" by selecting one from the three categories (upper, middle, or low).

Significant ethnic group differences were found by place of birth, education level, self-rated health, and number of chronic conditions. Over one-third (37.5%) of Filipino respondents and 19.4% of Chinese respondents were born overseas, compared to 5.1%-9.3% of other ethnic groups ($P<.001$). More than half (57.9%-66.7%) of Caucasian, Japanese, and Chinese respondents had college degrees, compared to only a third of NHOPI and Filipino participants ($P<.001$). More than half of the participants reported their health as good (61.1%). However, 30% of Caucasians reported their health is "excellent", compared to only 18.8%-22.6% of the other groups ($P=.009$). Also, 33.8% of Caucasians reported having no chronic health conditions, compared to 16.7%-24.8% of other groups ($P=.02$). More than half of NHOPI, Japanese, and Filipinos (50%, 51%, and 63%, respectively) reported having hypertension ($P<.001$). According to self-reported prevalence of chronic conditions, 17.2% of the sample reported having diabetes, but prevalence ranged from 9.5% of Caucasians to 25% of Filipinos and 27% of NHOPI ($P<.001$).

Genetics and Economic Status

Regardless of ethnicity, about half felt that genetics had great impact on lifespan, and ethnic differences were not significant (Table 2). However, perceptions of impact of economic status varied by ethnicity, with 41%-44% of NHOPI, Filipino, and Chinese respondents feeling that economic status had a great impact on lifespan, vs only 28% of Caucasians and 33% of Japanese ($P=.019$).

Lifestyle Factors

In terms of lifestyle factors, more than half of the participants felt that eating habits and exercise had great impact on lifespan, and ethnic differences were not significant. However, significant ethnic differences were seen for drinking and smoking. Almost two-thirds (63.5%) of Chinese felt drinking alcohol had great impact on health compared to 43.8% of Filipinos, and 31%-

Table 1. Demographic of the Sample							
	Caucasian (n=284) n (%)	NHOPI (n=141) n (%)	Japanese (n=197) n (%)	Filipino (n=48) n (%)	Chinese (n=63) n (%)	All (n=733) n (%)	P-value
Age							
50s	72 (25.4)	51 (36.2)	64 (32.5)	18 (37.5)	17 (27.0)	222 (30.3)	.035
60s	118 (41.5)	55 (39.0)	62 (31.5)	17 (35.4)	32 (50.8)	284 (38.7)	
70s+	94 (33.1)	35 (24.8)	71 (36.0)	13 (27.1)	14 (22.2)	227 (31.0)	
Female	154 (54.4)	77 (54.6)	100 (50.8)	25 (52.1)	32 (50.8)	388 (53.0)	.923
Married	165 (58.9)	79 (56.0)	118 (59.9)	32 (66.7)	36 (58.1)	430 (59.1)	.778
Born Overseas	17 (6.0)	13 (9.3)	10 (5.1)	18 (37.5)	12 (19.4)	71 (9.6%)	<.001
Education Level							
Less than BA	108 (38.0)	89 (63.1)	83 (42.1)	30 (62.5)	21 (33.3)	331 (45.2)	<.001
BA or Higher	176 (62.0)	52 (36.9)	114 (57.9)	18 (37.5)	42 (66.7)	402 (54.8)	
Living Standard							
Upper	62 (22.1)	31 (22.0)	37 (19.0)	8 (17.0)	16 (25.4)	154 (21.2)	.823
Middle	196 (70.0)	101 (71.6)	147 (75.4)	35 (74.5)	45 (71.4)	524 (72.2)	
Low	22 (7.9)	9 (6.4)	11 (5.6)	4 (8.5)	2 (3.2)	48 (6.6)	
Missing	4	0	2	1	0	7	
Self-rated Health							
Excellent	86 (30.3)	28 (19.9)	38 (19.3)	9 (18.8)	14 (22.6)	175 (23.9)	.009
Good	161 (56.7)	82 (58.2)	134 (68.0)	28 (58.3)	42 (67.7)	447 (61.1)	
Not so Good/Poor	37 (13.1)	31 (21.9)	25 (12.7)	11 (22.9)	6 (9.7)	110 (15.0)	
Missing					1	1	
Health Conditions							
None	96 (33.8)	35 (24.8)	45 (22.8)	8 (16.7)	15 (23.8)	199 (27.1)	.020
Hypertension	85 (29.9)	71 (50.4)	100 (50.8)	30 (62.5)	29 (46.0)	315 (43.0)	.001
Diabetes	27 (9.5)	38 (27.0)	39 (19.8)	12 (25.0)	10 (15.9)	126 (17.2)	.001
High Cholesterol	70 (24.6)	45 (31.9)	79 (40.1)	21 (43.8)	20 (31.7)	235 (32.1)	.003
Heart Disease	31 (10.9)	12 (8.5)	15 (7.6)	5 (10.4)	7 (11.1)	70 (9.5)	.761
Rheumatoid Arthritis	27 (9.5)	18 (12.8)	15 (7.6)	4 (8.3)	3 (4.8)	67 (9.1)	.364
Allergy	77 (27.1)	26 (18.4)	41 (20.8)	9 (18.8)	15 (23.8)	168 (22.9)	.246

Table 2. Number and Percentage in Each Group that Felt this Factor had a "Great Impact" (vs "some" or "no") on Life Span							
	Caucasian (n=284) n (%)	NHOPI (n=141) n (%)	Japanese (n=197) n (%)	Filipino (n=48) n (%)	Chinese (n=63) n (%)	All (n=733) n (%)	P-value
Genetics	151 (53.7)	58 (42.3)	99 (50.8)	21 (43.8)	29 (46.0)	358 (49.4)	.207
Economic status	79 (28.0)	58 (41.7)	65 (33.2)	21 (43.8)	26 (41.3)	249 (34.2)	.019
Eating habits	192 (67.8)	101 (71.6)	130 (66.0)	32 (66.7)	43 (68.3)	498 (68.0)	.867
Exercise	199 (70.1)	101 (71.6)	137 (69.5)	34 (70.8)	46 (73.0)	517 (70.5)	.983
Drinking alcohol	101 (36.2)	44 (31.2)	71 (36.4)	21 (43.8)	40 (63.5)	277 (38.2)	<.001
Smoking cigarettes	202 (71.6)	75 (53.2)	125 (63.5)	21 (43.8)	48 (76.2)	471 (64.4)	<.001
Stress	181 (63.7)	85 (60.7)	111 (56.6)	23 (47.9)	50 (79.4)	450 (61.6)	.005
Health knowledge	163 (57.4)	99 (70.2)	109 (55.3)	32 (66.7)	38 (60.3)	441 (60.2)	.047
Healthcare access	181 (63.7)	103 (73.0)	116 (58.9)	39 (81.3)	46 (73.0)	485 (66.2)	.006
Working conditions	113 (40.4)	67 (47.9)	80 (40.8)	30 (65.2)	35 (55.6)	325 (44.8)	.005
Home environment	152 (53.3)	90 (63.8)	101 (51.3)	35 (72.9)	37 (58.7)	415 (56.6)	.020
Community	67 (23.6)	60 (42.6)	43 (22.1)	18 (37.5)	14 (22.2)	202 (27.6)	<.001
Natural environment	139 (49.3)	83 (59.3)	63 (32.0)	26 (54.2)	26 (41.3)	337 (46.2)	<.001

36% of the other groups ($P < .001$). The pattern for smoking was a bit different, with 72%-76% of Caucasians and Chinese feeling this had great impact on lifespan, vs 43.8% of Filipinos, 53.2% of NHOPI, and 63.5% of Japanese ($P < .001$). Significant differences also were seen in impact of stress, with 79.4% of Chinese agreeing that stress had great impact on lifespan, vs 47.9% of Filipinos, 56.6% of Japanese, and 61-64% of NHOPI and Caucasians ($P = .005$).

Health Knowledge and Healthcare Access

Ethnic differences were seen in the importance of health knowledge and healthcare access on longevity. Specifically, 70.2% of NHOPI felt health knowledge had a great impact, compared to fewer in other groups ($P = .047$). In terms of healthcare access, 81.3% of Filipinos felt this had a great impact on longevity, compared to significantly lower percentages of Japanese (58.9%) and Caucasians (63.7%) ($P = .006$).

Environmental Factors

The last category was environmental factors, which included working conditions, the home environment, the community, and the natural environment. All ethnic differences were significant, with higher percentages seen for NHOPI and Filipinos compared to the other groups. For example, 65.2% of Filipinos felt working conditions had a great impact on lifespan, vs only 41% of Caucasians and Japanese ($P = .005$). Also, 72.9% of Filipinos felt the home environment had a great impact on longevity, compared to a low of 51.3% among Japanese ($P = .020$); 42.6% of NHOPI felt the community had a great impact on longevity, compared to a low of 22.1% among Japanese; and 59.6% of NHOPI felt the natural environment had great impact, compared to a low of 32.0% among Japanese.

Discussion

This paper explored ethnic differences in perceived impact of various factors on longevity with a goal of guiding the development of culturally relevant health messages and interventions. This study found a number of interesting differences across ethnic groups, which are discussed here.

Two-thirds or more of participants in all ethnic groups felt that eating habits and exercise had great impact on lifespan. Still, educational interventions are needed to help older adults translate diet and exercise knowledge into action, as the proportion of older adults who are overweight or obese is relatively high. Specifically, among adult age 50+, only 23.0% of NHOPI, 38.9% of Caucasians, 43.4% of Filipinos, 44.9% of Japanese, and 55.5% of Chinese meet recommendations for BMI (18.5-25).¹⁵

In contrast, compared to other ethnic groups, smaller proportions of Filipinos and NHOPI felt smoking had great impact on longevity. At the same time, adults age 50+ in these two groups had a relatively high smoking prevalence: 18.7% in NHOPI and 12.5% in Filipinos (compared to 10.8% of Caucasians, 8.7% of Japanese, and 4.7% of Chinese age 50+).¹⁶ This suggests that educational messages about the dangers of smoking need

to be better communicated to these two groups. Almost 40% of our Filipino sample was born overseas, presumably in the Philippines where anti-smoking legislation is more lax.¹⁷ Health professionals should be aware that immigrants from counties where smoking is more accepted may need basic education about its risks. Smoking education and cessation programs, including the Hawai'i Tobacco Quitline, should outreach to these priority groups.

Drinking was considered to have a great impact on lifespan among Chinese. Although it was not clear whether drinking was thought to impact lifespan in a positive or negative way, research suggests that the drinking of alcohol in Chinese culture is done socially, eg, in family gatherings and at special occasions like graduation, rather than every day or by oneself.¹⁸ Only about one-third of other groups felt that drinking had a great impact on lifespan. It should be noted, however, that about 6.5% of adults age 50+ in Hawai'i report to be heavy drinkers¹⁹ and about 11.0% report to be binge drinkers.²⁰

Compared with other ethnic groups, significantly smaller percentages of Caucasians and Japanese felt that socio-economic status, working conditions, and healthcare access had a great impact on health. In Hawai'i, relatively high proportions of Caucasians and Japanese have college degrees, which help them qualify for professional (rather than blue collar) jobs in relatively safe working environments and with good access to health insurance and healthcare. From their position of privilege, they may not be aware of the abundance of data linking socio-economic status to health and longevity.^{5,21,22} In contrast, large proportions of NHOPI and Filipinos (especially new immigrants) work in agricultural, construction, and service industries, which tend to be lower paying and more physically demanding, and many work more than one job.²³⁻²⁵ Research has found that blue-collar workers are at higher risk for chronic disease than white-collar workers.²⁶⁻²⁷ Also, many Filipinos often remit part of their incomes back to the Philippines to support relatives living there, reducing their access to disposable income in Hawai'i.²⁸ Broad policy changes could help to build economic and social welfare systems to help reduce these disparities.^{29,30} Meanwhile, health professionals play an important role in connecting low-income individuals with government, clinic, and non-profit programs to increase access to health.

All ethnic groups except Filipinos perceived that stress has a great impact on lifespan. As noted by Guerrero and colleagues, Filipinos tend to draw upon humor, faith, and family as a means of coping with the burdens of everyday life and accepting events over which they have no control.²⁸ NHOPI were most likely to believe that the community and natural environment had a great impact on lifespan. The *'aina* (land) is very important in Native Hawaiian traditions, in that the natural environment was respected, cared for with prudent stewardship, and never owned.³¹ Again, health educators should be knowledgeable about cultural traditions and build on cultural strengths as they educate and promote interventions to improve health.³² It is promising that most professional schools now include courses in cultural competence.³³

These findings add to the growing Hawai'i-based literature on the importance of tailoring health education messages for different groups. Researchers at the UH and at community-based projects like 'Imi Hale Native Hawaiian Cancer Network and Pacific Diabetes Today (both based at Papa Ola Lokahi) have published findings on the best ways to deliver educational programs to specific ethnic groups and in specific communities. For example, local research continues to find that: (1) education should be offered through the clubs, churches, and social and family networks appropriate to the target groups; (2) public service announcements, paid advertising, and ideas for stories should be directed at the preferred mainstream or ethnic media outlet, and (3) lay educator and navigation programs are especially effective at changing behavior.³⁴⁻³⁹

There were several limitations in this study. First, the sample was not equally distributed across ethnic groups. Chinese and Filipino participants numbered less than 100. Having more participants in these groups would increase our confidence in the findings. Second, the sample may not represent the entire ethnic group. Although this study used random-digit dialing, participants must have had a phone (landline or mobile), answered the phone, and agreed to participate. Third, data were self-reported, so social desirability bias may be an issue. Fourth, the survey did not ask whether each factor negatively or positively contributed to lifespan, and different individuals and ethnic groups may have interpreted the questions differently. Additional research is necessary to clearly understand the association of each factor with personal perception on lifespan. Lastly, our analysis was limited to the subsample age 50 years or older. However, analysis of the full sample found similar patterns.

Conclusions

Although there were limitations, this study confirms the value of educating adults on the multiple factors influencing lifespan, including social determinants of health, and of tailoring educational messages to our different ethnic groups in Hawai'i. Older adults are more likely than other age groups to have chronic conditions, and it is important to incorporate the cultural beliefs and practices into developing interventions and policies. Continuing education is needed for health professionals and researchers on how to tailor interventions to our different ethnic communities. Future research will be needed to further understand how educational needs differ by length of time in the Hawai'i and for older adults with multiple ethnic backgrounds.

Conflict of Interest

None of the authors identify any conflict of interest.

Acknowledgement

This study was a part of cross-international study funded by Saitama Prefectural University. Data were collected through SMS. This study was approved by University of Hawai'i Institutional Review Board and Saitama Prefectural University Institutional Review Board.

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High School Football Players Use Their Helmets to Tackle Other Players Despite Knowing the Risks

Andrew M. Kuriyama MPH; Austin S. Nakatsuka MD; Loren G. Yamamoto MD, MPH, MBA

Abstract

There is greater attention to head-related injuries and concussions in American football. The helmet's structural safety and the way that football players use their helmets are important in preventing head injuries. Current strategies include penalizing players for high-risk behavior such as leading with their helmet or hitting an opposing player above the shoulder. Passive strategies include helmet modification to better protect the head of the players or to change the playing style of the players. Hawai'i high school varsity football players were surveyed to determine how they use their helmets and how a new helmet design would affect their style of play. One hundred seventy-seven surveys were completed; 79% said that they used their helmet to hit an opposing player during a tackle and 46% said they made this contact intentionally. When asked about modifying helmets with a soft material on the outside, 48% said they thought putting a soft cover over a regular helmet would protect their head better. However, many participants said that putting a soft cover over their regular helmet was a bad idea for various reasons. Most young football players use their helmets to block or tackle despite being taught they would be penalized or potentially injured if they did so. By gaining a better understanding of why and how players use their helmets and how they would respond to new helmet designs, steps can be taken to reduce head injuries for all levels of play.

Keywords

football, helmets, head injury, concussion, head injury prevention, concussion prevention, injury prevention

Introduction

American football is one of the most popular sports in the United States to watch and in which to participate.¹ Football players on all levels of play are getting bigger, stronger, and faster which makes the game more appealing to fans.² However, the increase in the size and speed of its players has resulted in more concern about head injuries and head safety.² Former National Football League (NFL) players have sued the NFL for improper protocol when dealing with player safety related to concussions.³ These retired players suffer from a variety of neurocognitive and neurodegenerative diseases, which are possible long-term consequences of concussions. The concern has now extended to youth and high school football players. Studies show greater risk for long term cognitive harm from injuries at younger ages.⁴ Pop Warner (a major youth football league in the United States) participation dropped 9.5% from 2010 to 2012, while flag football participation increased.⁵ The drop in participation could be a result of parents becoming better informed about injury prevention given the greater concern regarding concussion and neurocognitive harm.

Concussions in sports are common and its incidence is increasing.^{6,7} On the national level, football causes the most concussions among high school sports.^{6,7} Head Case (a sports concussion website) suggests that there were 3.8 million con-

cussions reported in 2012 (presumably in the United States), which is double that reported in 2002.⁶ From 2010 to 2012, Hawai'i public high schools reported 930 total concussions in all sports, and 425 of these were from football.⁸

Passive injury prevention strategies to address concussions and head safety involve creating a safe helmet worn by players to hopefully reduce the amount of impact to the head. In contrast, active injury prevention strategies in which the players must do something (behavior change) for the strategy to work, include teaching players about the risk of helmet to player contact, avoiding intentional helmet to player contact, and instituting a game penalty that results from such helmet to player contact. The effectiveness of these strategies can be measured by the number of occurrences of such penalties and the number of concussions diagnosed in players.

The purpose of our study was to survey high school football players' playing experience, their understanding of helmet contact risk, their opinions of potential helmet modifications, and how they use their helmets while playing. This data will help to determine the frequency of helmet to player contact in the current era of increasing awareness of helmet to player concussion risk and the imposition of helmet to player contact penalties (i.e., the active injury prevention strategies currently in place). This information will also help to guide the development of future prevention strategies.

Methods

We developed a 12 item survey (see Tables 1, 2, and 3) for high school players on how they used their helmets and how a new helmet design would affect their style of play. We limited our study to varsity team level high school football players aged 14 years or above.

This survey was developed by the study investigators based on reading the background literature. This survey is not based on previously existing survey instruments. We added questions about how players would react to modifying the exterior of the current helmet based on a previous study that we published demonstrating the reduction of head impact severity by applying foam to the exterior of the helmet.⁹ The survey had to be short and easily comprehended with clear replies to respect the time commitment required to complete the survey. We did not pilot test the survey on actual players, because we lacked easy access to high school football players, but the survey was reviewed and modified by the study investigators independently as well as by reviewers at the Hawai'i Pacific Health Research Institute, the Western IRB reviewers, and the University of Hawai'i Department of Public Health Sciences.

The surveys contained terminology that is well known to football players. “Spearing” or “leading with the helmet” refers to forcefully driving the instigating player’s helmet into the opposing player, usually at high speed. “Helmet slapping” refers to a celebratory gesture when a player strikes the helmet of a teammate with an open palm.

We had significant connections to many high school football teams. The study investigators, other faculty, and community physicians had close personal and professional relationships with many high school football teams in the State of Hawai‘i. Athletic directors and head coaches across the state were contacted via email, telephone, and personal conversation, to describe the study and ask for voluntary participation in the study. Approximately 16 schools were contacted via an athletic director, head coach, or assistant coach. Athletic directors and coaches were given copies of the survey for them to consider for participation. We informed them that the names of the participating schools would not be disclosed in the research publication. Only four teams agreed to participate (two public schools and two private schools). All surveys were completed in a team meeting session of approximately 30 minutes supervised by the study investigators. Players were informed that the survey was optional and anonymous. We were not able to determine the number of eligible participants, because we only had access to those who volunteered. The 12-item survey was distributed on paper to each of the participating players who came to the team meeting. Players completed the survey individually, and returned the completed survey form to the study investigators during the team meeting session. This study did not perform any preparation or teaching prior to, during, or following the surveys. To avoid any possibility of coercion, we informed the players that it was OK to turn in a blank survey and that we preferred a blank survey over a falsely completed survey (one in which the wrong or random responses were circled). A total of 177 high school varsity football players participated and completed the survey questionnaire. We did not receive any blank surveys submitted by the players. Surveys were administered before and during the 2013 and 2014 football seasons. An energy bar was given to each player after they completed their survey as a thank you snack for participating. Survey responses and percentages were calculated to summarize the results. This study was approved by Western IRB (WIRB, Olympia, WA) and parental consent was waived.

Results

The survey items and their responses are tabulated in Tables 1, 2, and 3. One hundred seventy-seven players completed the survey; 79% confirmed that they had used their football helmet to hit another player on the opposing team during a tackle in a game, practice, or drill (29%, more than 10 instances; 18%, 5-10 instances; 31%, 1-4 instances; 21%, never) (Table 1). Fifty-eight percent indicated that they did this during both games and practice, 10% in games only, and 11% in practice only.

In regard to leading or tackling with their helmet, 9% were told that this is a good way to tackle, 58% were told that this

	n (%)
Have you ever used your football helmet to hit another player on the other team during a tackle in a game or practice or drill?	
Yes	139 (79%)
Did you do this during a game, a practice (includes drills), or both?	
Never did this	36 (20%)
Game only	18 (10%)
Practice only	20 (11%)
Both game and practice	103 (58%)
About how many times have you done this in the last year in total (games and practice)?	
Never	38 (21%)
1-4 times	55 (31%)
5-10 times	32 (18%)
More than 10 times	52 (29%)
Even if you did this before, have you ever been taught (by coaches, parents, or anyone) that spearing and leading with your helmet is a bad idea?	
I was told it's a good way to tackle.	15 (9%)
I was told this is a poor way to tackle.	102 (58%)
I was told this would hurt the other player.	127 (72%)
I was told this would hurt me.	162 (92%)
I was told this would result in a penalty.	139 (79%)
I was told I would get kicked out of the game.	105 (59%)
I was told to NEVER block or tackle using my helmet.	124 (70%)
Have you ever made helmet-to-helmet contact with an opposing player during a tackle or block?	
Yes, it was an accident.	64 (36%)
Yes, I caused it on purpose.	27 (15%)
Yes, the other player caused it on purpose.	14 (8%)
Yes, I caused it one or more times and other players caused it one or more times.	55 (31%)
No, I have never had helmet to helmet contact.	15 (9%)
No Response	2

is a poor way to tackle, 72% were told that it would hurt the other player, 92% were told that it would hurt me (the player initiating the contact), 79% were told that this would result in a game penalty, 60% were told that this would result in being ejected from the game, and 70% were told never to block or tackle using their helmet (Table 1).

Nine percent of players never made helmet to helmet contact with an opposing player (Table 1). Thirty-six percent experienced accidental helmet to helmet contact, 15% confirmed that they caused deliberate helmet to helmet contact, 8% confirmed that the opposing player caused deliberate helmet to helmet contact, and 31% caused and received more than one episode of deliberate helmet to helmet contact.

Players were presented with a theoretical helmet redesign placing soft material over the outside of the current helmet. Half of respondents replied that it would hurt less, while only 9% replied that it would hurt more, and 41% replied that it would be the same (Table 2). Thirteen percent thought this helmet modification would be a good idea, 31% thought it would be a bad idea, and 56% were not sure. Among the various reasons reported, 30% replied that this is a bad idea because it takes away the hardest part of the player's gear, requiring them to switch to the shoulder pads or face guard to inflict pain on the opposing player.

	N (%)
If your opponent's football helmet was covered with a soft material (like foam rubber) on the outside, would it hurt less if you got hit by it during a tackle or block (compare getting hit by regular helmet and getting hit by a helmet covered with soft material)?	
Regular helmet is more sore	88 (50%)
Foam covered helmet is more sore	16 (9%)
Both helmets are the same	73 (41%)
Do you think that playing with a helmet that has a soft cover over your regular helmet would be a good idea?	
This is a good idea.	23 (13%)
This is a bad idea.	55 (31%)
I'm not sure.	99 (56%)
Do you think that putting a soft cover over your regular helmet would protect your head better?	
Yes.	85 (48%)
No.	87 (49%)
No Response	5
Why do you think that playing with a helmet that has a soft cover over your regular helmet would be a good idea or a bad idea?	
Bad idea, soft cover over my helmet would make my head look big	67 (38%)
Bad idea, soft cover over my helmet would make it harder (more difficult) to tackle/block other players.	72 (41%)
Bad idea, soft cover over my helmet takes away the hardest part of my gear. I will now have to use my shoulder pad or face guard to inflict some real pain on my opponent when tackling him.	52 (30%)
Bad idea, the sound of helmets colliding is part of the game of football. Putting a soft cover over our helmets would change the sound of the game.	51 (29%)
Good idea, soft cover over my regular helmet would protect my head better.	76 (43%)
Good idea, soft cover over my regular helmet would prevent me from wanting to spear or lead with my helmet during tackling and blocking.	40 (23%)
If your helmet was covered with a soft material on the outside, would you ever use it to hit another player on the other team during a tackle?	
Yes-because hitting other players with my helmet helps me tackle better	63 (36%)
Yes-because I think it could still hurt the other player	37 (21%)
Yes-for another reason	26 (15%)
No-because it wouldn't hurt the other player	25 (14%)
No-because I never hit other players with my helmet	53 (30%)
No-for another reason	30 (17%)

When asked about celebratory helmet slapping (Table 3), 66% had their helmet slapped resulting in no head pain, but 43% sustained helmet slapping that resulted in slight pain to the head or neck and 11% sustained helmet slapping that resulted in more than slight pain to the head or neck. Neck pain sustained from helmet slapping was less than head pain.

	N (%)
Did you ever get your helmet slapped by your team mates in celebration when you did something really good?	
No, I never had my helmet slapped.	15 (8%)
I had my helmet slapped, but no pain resulted.	116 (66%)
I had my helmet slapped and it hurt my HEAD slightly.	55 (31%)
I had my helmet slapped and it hurt my HEAD more than slightly (a headache or bad headache).	14 (8%)
I had my helmet slapped and it hurt my NECK slightly.	22 (12%)
I had my helmet slapped and it hurt my NECK more than slightly (a neck ache or bad neck pain).	5 (3%)

Discussion

These results indicate that more than 90% of the players are aware of the head injury consequence and 79% of the players were aware of the penalty consequences of helmet to player contact, yet 91% of the players experienced helmet to player contact and 46% of players intentionally initiated this contact, despite knowing these consequences.

More information on the neurocognitive and neurodegenerative risks of concussions is available now than in the past. More research is needed to prevent and treat these injuries properly. Our survey indicates that the current active prevention strategies (that requires player behavior modification) of teaching players about their personal head injury harm and penalizing players for helmet to player contact are not working well since players continue to use their helmet for tackling despite knowing these consequences.

A more passive approach is to see how players use their helmets and if they are open to the idea of a new helmet model. When asked their opinion on a soft cover over their helmet, only 13% thought it was a good idea. This idea of helmet redesign is new and the results show that when asked more specifically about the benefits of this specific helmet redesign, 48% replied that it would protect their head better.

Although the pain consequences of celebratory helmet slapping were small in this survey, some responses suggest that the consequence was more than minor. Head injury concussion consequences are known to be additive and any additional head trauma could add to the potential for neurocognitive harm.¹⁰ High school players are generally not as large or as strong as college or professional players,¹¹ so this might be a bigger issue at the upper levels of play and should be further explored. A larger, heavier, and faster hand increases all the parameters that lead to force and momentum, potentially resulting in a

disproportionately greater consequence on the recipient of the helmet slap. Helmet slapping is unnecessary and it would be preferable to celebrate with maneuvers that did not involve additional head trauma.

Most of the research on football related head injuries has focused on concussions, helmet designs, and risk factors. Our survey is unique in its probe into what players have been taught, and what they actually do on the playing field. Our results indicate that active injury prevention strategies may not be as effective as we would like them to be, therefore a passive injury prevention strategy may be needed. These factors point to the need for a modified helmet design.

While we assume the current hard helmet is safer than the leatherhead helmet of a previous football era, this might be paradoxically incorrect. One study comparing the protective safety parameters of helmets concluded that most of the current helmet designs were no more protective than the leatherhead helmet.¹² Additionally, if the hard helmet promotes and encourages helmet-to-player contact, while the leather helmet discourages this, the hard helmet might actually be detrimental. This is supported by the finding that youth rugby players were motivated to wear headgear because this enabled them to tackle harder suggesting that a belief in its protective capabilities may promote more aggressive tackling behavior,¹³ despite evidence that protective headgear does not reduce the rate of head injury or concussion.¹⁴ In rugby, illegal play is associated with a higher injury risk indicating that rules don't necessarily prevent injuries.¹⁵ Note that high level rugby players do not use a helmet and while there is substantial player contact in rugby, its concussion risk is not noticeably higher than in American football.¹⁵⁻²² If head protection gear promotes a more injurious style of play coupled with no true additional protection afforded by a hard helmet over a leatherhead, it is expected that this could paradoxically increase the frequency of concussions.

A passive injury prevention measure of applying a soft exterior to the helmet may also be considered. One study demonstrated that a foam exterior applied over a standard hard helmet reduced the impact severity as measured by accelerometers within the helmet.⁹ This suggests a two-fold benefit: (1) Overall impact reduction, and (2) By removing the incentive for intentional helmet-to-player contact, an overall reduction in helmet to player injuries.

This study has some key limitations that should be addressed. The sample size is small. Since the coaches and athletic directors were shown the survey prior to the team surveys, they could have taught their players the proper technique of tackling and blocking prior to the survey and/or they could have counseled them on how to answer these questions to make their school look good (or not as bad). Also, coaches potentially knew how their players would reply and this perhaps affected their decision on whether to participate in the survey. Our survey relied on player recall and reporting which could be biased. The survey indicated that 70% were taught to never tackle in this helmet leading manner. Players could have responded a certain way because they didn't want to contradict their coaching or

indicate that their playing performance violated the rules of the game. All of these factors would underestimate the severity of the areas of concern. In other words, the true picture might be worse than what our survey results indicate.

Some players might not have had the opportunity to inflict pain using their helmets, or experience such pain inflicted upon them, because of their playing position, their spot in the depth chart (whether they are a starting player who plays frequently and more likely to have sustained an injury, or a substitute player who plays infrequently and is less likely to have sustained an injury), and their previous playing experience level.

In retrospect, we could have obtained more information by collecting information about player position and previous concussion symptoms. Players who have sustained previous concussions might have different attitudes about helmet to player contact and a safer helmet design. The player's position could also potentially affect how they use their helmets since a previous study has demonstrated that the different positions have different concussion risks.^{23,24} However, collecting more information about the overall health status of a minor subject would have required written parental consent, making the survey much more difficult.

When describing the helmet redesign, it was only a worded description and players could have interpreted it differently. For example, they might not have been concerned about the visual appearance of the helmet until the survey pointed out to them that it might make their head look big.

Further research is needed to understand the true long-term and short-term effects of football concussions. Getting a closer look at players' intent while playing and exploring potentially safer helmet designs is an area that needs to be focused on for future studies.

Conclusion

This research adds to the current literature on football and helmet safety and can contribute to reducing head injuries caused by the sport. Coaches and parents can adjust how their players and children are approaching the sport of football and can take steps to help reduce the amount of head injuries. Players, regardless of what they are told, will use their helmets to tackle and block so other steps must be taken. Since players know the injury and penalty risks of using their helmets and still use them, making the rules stricter (eg, ejecting from game immediately) or modifying the helmet design would be more effective strategies for reducing head injuries.

Conflict of Interest

None of the authors identify any conflict of interest.

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The Wandering Woman: A Case Study of Catatonia vs Factitious Disorder

Jennifer W.H. Wong MD and Steven R. Williams MD

Abstract

A 61-year-old woman with an unknown psychiatric history presented with mutism, stupor, negativism, and withdrawn behavior. She was admitted to the psychiatric unit for what appeared to be catatonia. Medical records were not readily available. A comprehensive evaluation did not uncover any medical etiology. Lorazepam was ineffective at consistently reversing her catatonic symptoms. During week three of hospitalization, she was given olanzapine with subsequent improvement in her negativism. Several physicians believed her catatonic symptoms were feigned given multiple episodes of spontaneous purposeful movement when she was not under the direct supervision of staff. There is minimal literature on distinguishing catatonia and factitious disorder. This distinction is crucial because these diagnoses require very different treatments, and the iatrogenic complications related to the treatment of catatonia with high-dose benzodiazepines and electroconvulsive therapy are significant. Rapid access to electronic health records can facilitate treatment for patients who cannot provide a medical history, especially when factitious disorder is included in the differential diagnosis.

Keywords

bipolar disorder, catatonia, conversion disorder, factitious disorder, malingering

Abbreviations

DSM-4 = Diagnostic and Statistical Manual, 4th Edition

DSM-5 = Diagnostic and Statistical Manual, 5th Edition

Introduction

Catatonia is etiologically related to numerous psychiatric, neurologic, and medical conditions. Catatonia was thought to be under-recognized in the Diagnostic and Statistical Manual, 4th Edition (DSM-4),¹ so its diagnostic criteria was updated in the Diagnostic and Statistical Manual, 5th Edition (DSM-5) in order to improve recognition and enhance clinical utility. This update has increased the importance of catatonia given its associated morbidity and mortality and the need for urgent and specific treatments. If left untreated, malignant catatonia has a mortality rate of almost 100%.^{2,3} We present a case of a homeless psychiatric inpatient who appeared to be feigning her catatonic symptoms, which led to greater consideration of the diagnosis of factitious disorder and how this significantly changed her treatment and disposition.

Patients with factitious disorder can present with numerous types of physical and behavioral symptoms. The core definition of factitious disorder is a condition in which a person intentionally feigns illness in the absence of obvious external rewards in order to assume the “sick role.”⁴ To date, there is very little literature on factitious disorder presenting as catatonia. While DSM-5 will likely bring increased recognition and diagnosis of catatonia, factitious disorder should also be considered since the treatment for these two diagnoses are very differ-

ent. The mainstay treatments of catatonia include high-dose benzodiazepines and electroconvulsive therapy, both of which may have unintended complications. Treatment of factitious disorder is usually psychotherapy. According to DSM-5, factitious disorder in hospital settings is estimated to be present in 1% of individuals.⁴ In psychiatric inpatient units, there is a greater percentage of homeless and transient patients who do not provide a psychiatric history. Consequently, identifying inpatient psychiatric patients with factitious disorder poses a unique challenge. Moreover, patients with factitious disorder can endure serious iatrogenic harm related to the treatment of their feigned signs or symptoms, so accurate diagnosis is essential.⁵

Homelessness in Hawai‘i has gained a tremendous amount of attention over the past few years. The state’s rapidly growing homeless population has reached a five-year high of 7,620 which is the highest per capita in the country.⁶ Approximately 70% of Hawai‘i’s homeless population are immigrants, and this steady influx of homeless has placed an insurmountable strain on the state’s resources, forcing the government to declare a state of emergency.⁶ Obtaining a psychiatric history from these patients can sometimes be difficult, impeding an accurate diagnosis. This in turn can substantially increase the length of stay and the overall cost of healthcare.

Case Presentation

A 61-year-old woman with an unknown history was brought to a Hawai‘i emergency department by the police for disruptive behavior and psychotic symptoms. Soon after arriving to the hospital, she became immobile, mute, and would not eat or drink. A history could not be obtained secondary to mutism. On hospital day 20, collateral information was obtained from a friend, and medical records were received from the continental United States (US). Apparently, three days prior to admission, she had traveled by herself from the East Coast of the United States to Hawai‘i. Twenty years ago, she had lived in Hawai‘i with her ex-husband, who was a registered nurse and taught her about medicine. Following their divorce many years ago, she had moved to the East Coast. Her medical records revealed numerous psychiatric hospitalizations, multiple episodes of muteness, a mood disorder, and conversion disorder.

Upon admission, she was mute, immobile, and minimally responsive to painful stimuli. Physical exam was negative for rigidity, waxy flexibility, and echopraxia. Laboratory values including thyroid stimulating hormone level, toxicology, and computerized tomography of the brain were all unremarkable.

For several days, she remained immobile and mute, except to make her needs known, such as requesting water. Quotations from four different physicians were as follows:

- Patient with head down. When attempt is made to put head in straight up position, patient puts force against attempts to straighten head. Patient then puts head on table resting on arms. When arms are removed from under head, patient places arms back underneath head.
- [The patient's hand was passively held above her head, then released.] Patient didn't hit her face by her hand and has control of her bilateral upper extremities.
- She is nonverbal to me, does not open her eyes on command but then when I walk away, she opens her eyes, takes a quick look around and closes them again.
- She has been seen often times to have various purposeful movements spontaneously, especially when not under direct observation of the medical staff.

She was given 1 mg of intravenous lorazepam prior to meals, then would sometimes become alert and eat. On day 10, she was placed in a wheelchair for refusing to walk, in addition to concerns about an inability to walk. She was then removed from her private room for the first time and placed in the common area. In the common area, she refused all meals and broke her muteness and immobility to explain that her anorexia "was personal" before returning to her room without assistance. She was administered 2 mg of intramuscular lorazepam without subsequent improvement in her catatonic symptoms. This constituted a failed "lorazepam challenge test" and was repeated twice with the same results. On day 15, medical records were obtained and revealed prior diagnoses of bipolar disorder, unspecified and conversion disorder. Thus, the patient was empirically given 10 mg of intramuscular olanzapine. On day 31, her mood was "much better", and she began talking to physicians. The following day, she was discharged to a shelter on 10 mg of oral olanzapine. Two weeks after discharge, she was admitted to a psychiatric unit in Georgia. Her diagnosis and length of stay in Georgia are unknown.

Discussion

The patient presented with predominantly catatonic symptoms. She was evaluated by eight psychiatrists and one geriatrician. Her muteness and unavailable medical records contributed to a wide differential diagnosis which included factitious disorder, depressive disorder, personality disorder, conversion disorder, psychotic disorder and malingering. Depression was considered given her withdrawn behavior and a diagnosis of bipolar disorder during previous hospitalizations. Personality disorder was considered since it is frequently associated with factitious disorder. Conversion disorder was considered given her sudden inability to walk and a diagnosis of conversion disorder during previous hospitalizations. A psychotic disorder was considered given her very unusual behavior and psychotic symptoms which brought her to the hospital. Malingering was considered because the patient did not have a place to live in Hawai'i, which may

have motivated her to assume the "sick role."

The patient's stupor, mutism, and negativism met the DSM-5 criteria for catatonia.⁴ However, her catatonic symptoms were found to be inconsistent when she was not under the direct supervision of staff. The patient was ultimately diagnosed with factitious disorder since her catatonic symptoms appeared feigned and given the lack of psychiatric hospitalizations prior to her divorce. Stressful events can trigger psychiatric hospitalizations in patients with factitious disorder due to abandonment issues.^{9,10} Feelings of abandonment in combination with the medical knowledge that she gained from her former marriage to a registered nurse in Hawai'i could have directed her to present in Hawai'i with catatonic symptoms. She also appeared to demand attention, and her history of psychiatric admissions in multiple US states was consistent with peregrination. She continued to assume the "sick role" soon after discharge by traveling to Georgia with admission to a psychiatric unit. Her medical records revealed previous diagnoses of bipolar disorder, unspecified, and conversion disorder. Bipolar disorder can present with catatonia, but not with deception as seen with this patient's inconsistent presentation.⁴ Conversion disorder was ruled against since "Factitious disorder with neurological symptoms is distinguished from conversion disorder by evidence of deceptive falsification of symptoms" per DSM-5.⁴

Catatonia is a psychiatric diagnosis that has gained more primacy in DSM-5. However, there remains minimal literature on distinguishing catatonia and factitious disorder.⁸ This distinction is crucial because these diagnoses require very different treatments, and the iatrogenic complications related to the treatment of catatonia with high-dose benzodiazepines and electroconvulsive therapy are significant.^{10,11} Rapid acquisition of medical records is extremely important because it influences the differential diagnosis and treatment decisions, especially for patients who cannot provide a medical history. There are often significant delays in obtaining medical records for the homeless and mentally ill who present with significant thought disorganization, cognitive deficits, or muteness. This is even more problematic for patients who have recently arrived from the continental US and have no family members or friends in Hawai'i who can provide collateral information. Medical records are becoming more available through the widespread use of electronic medical records, which is especially helpful when considering the diagnosis of factitious disorder.^{12,13} The most salient clinical point of this case study is that if a patient demonstrates inconsistencies in symptoms of catatonia, the index of suspicion for factitious disorder should be increased.

Increased consideration for the diagnosis of factitious disorder should be given to patients who present with symptoms similar to this case study. This may significantly reduce the length of stay as an inpatient and therefore the cost of care. In light of Hawai'i's rapidly growing migrant and homeless population, it is important to expedite acquisition of medical records for patients who are unable to provide a reliable medical history. Thus, efforts should be made to increase the availability of electronic health records.

In terms of a public health impact, the cost of care for immigrant homeless psychiatric inpatients has a substantial financial burden on the limited resources in Hawai'i. A large majority of these patients do not have identifiable health insurance, which increases the financial strain for the state of Hawai'i, which translates into less resources for all the people in Hawai'i. A solution to this problem has yet to be found. In the meantime, healthcare providers in Hawai'i will continue to provide the best quality of care to everyone, regardless of their psychiatric status and ability to pay.

Conflict of Interest

None of the authors identify any conflict of interest.

Acknowledgements

The University of Hawai'i Department of Psychiatry and the Queen's Medical Center in Honolulu, Hawai'i.

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MEDICAL SCHOOL HOTLINE

Graduate Certificate in Tropical Medicine

William L. Gosnell PhD and Kenton Kramer PhD

The Medical School Hotline is a monthly column from the John A. Burns School of Medicine and is edited by Satoru Izutsu PhD and Kathleen Kihmm Connolly PhD; HJMPH Contributing Editors. Dr. Izutsu is the vice-dean of the University of Hawai'i John A. Burns School of Medicine and has been the Medical School Hotline editor since 1993.

Background

Tropical infectious diseases inflict substantial health and economic burdens on developing countries, including many nations in the Asia-Pacific region. These infections, HIV, tuberculosis, and malaria for example, can become chronic and exacerbate the problem of poverty, thus hindering economic progress.¹ With limited resources, impoverished countries have limited capacity to develop or implement infectious disease control programs.

More than four decades ago a World Health Organization (WHO) Advisory Committee on Medical Research met and recommended an “expanded WHO programme for research and training related to tropical communicable diseases.”² Because diseases know no boundaries, Khan, et al, called for a more active role from US medical schools in promoting and encouraging international medical education.³ In addition, as a consequence of increased migration and international tourism, the introduction of tropical infectious diseases is increasing in areas where knowledge of these conditions is limited. An illustration of this growing need to train both laboratorians and clinicians to recognize parasitic infections was published by Palmieri, et al.⁴

The University of Hawai'i System (UH) has a collection of global health programs that exist in the College of Arts and Sciences, School of Nursing and Dental Hygiene, the College of Pharmacy, School of Social Work, Office of Public Health Studies, School of Medicine, and others. These programs include curricular offerings, faculty and student exchanges, clinical trials, clinical service opportunities, public health and population-based initiatives, and degree offerings. However, programs in tropical medicine are unique in their focus on global infectious diseases, particularly those endemic to tropical environments.^{5,6}

Department of Tropical Medicine, Medical Microbiology and Pharmacology

Since its inception in 1967, the Department of Tropical Medicine, Medical Microbiology and Pharmacology, based in the John A. Burns School of Medicine (JABSOM), has been a major contributor to global health education (Figure 1). Over the last 40 years the Department's Master's and PhD programs have trained students from China, Japan, Nepal, India, Thailand,

Malaysia, Philippines, Panama, Zambia, Zaire, and Zimbabwe, as well as the United States.

The Department is committed to narrowing the gap that exists between biomedical knowledge and populations most at risk of acquiring tropical diseases.⁷ In 2012, the department's faculty received five years of funding from the Fogarty International Center, National Institutes of Health to train Cameroonian students in conducting malaria research (D43TW009074). In addition, the Global Health Fellowship program supports postdoctoral fellows and scholars to conduct infectious diseases research in low middle-income countries (R25MH080661).⁸ Programs offering a Graduate Certificate in the Tropical Medicine (GCertTM) complement these projects by providing trainees with the opportunity to develop their content expertise during their research training, and provides an additional mechanism for students to obtain the knowledge and skills needed to undertake a significant role in control and prevention programs for the 21st century global resurgence of infectious diseases.⁹

Both the University of Hawai'i at Manoa (UHM) and the American Society for Tropical Medicine and Hygiene (ASTMH) have recently approved a GCertTM for JABSOM's Department of Tropical Medicine, Medical Microbiology, and Pharmacology. This graduate certificate is available for the Department's NIH-funded training programs for undergraduate and graduate students as well as providing a pathway for non-degree seeking professionals to obtain the knowledge and skills related to infectious diseases.

GCertTM Goals and Objectives

The GCertTM provides a foundation for students to pursue careers in clinical tropical infectious diseases (“clinical track”) and in non-clinical, allied health careers that require a background in tropical infectious diseases, such as public health epidemiology, medical technology, and biotechnology. For individuals in the clinical track, the GCertTM curriculum prepares them for the national certification examination in the ASTMH national Certificate of Knowledge in Clinical Tropical Medicine and Travelers' Health (CTropMed®) examination.

The GCertTM program provides an opportunity for health care professionals working in the community to obtain critical training in emerging infections that have the potential to

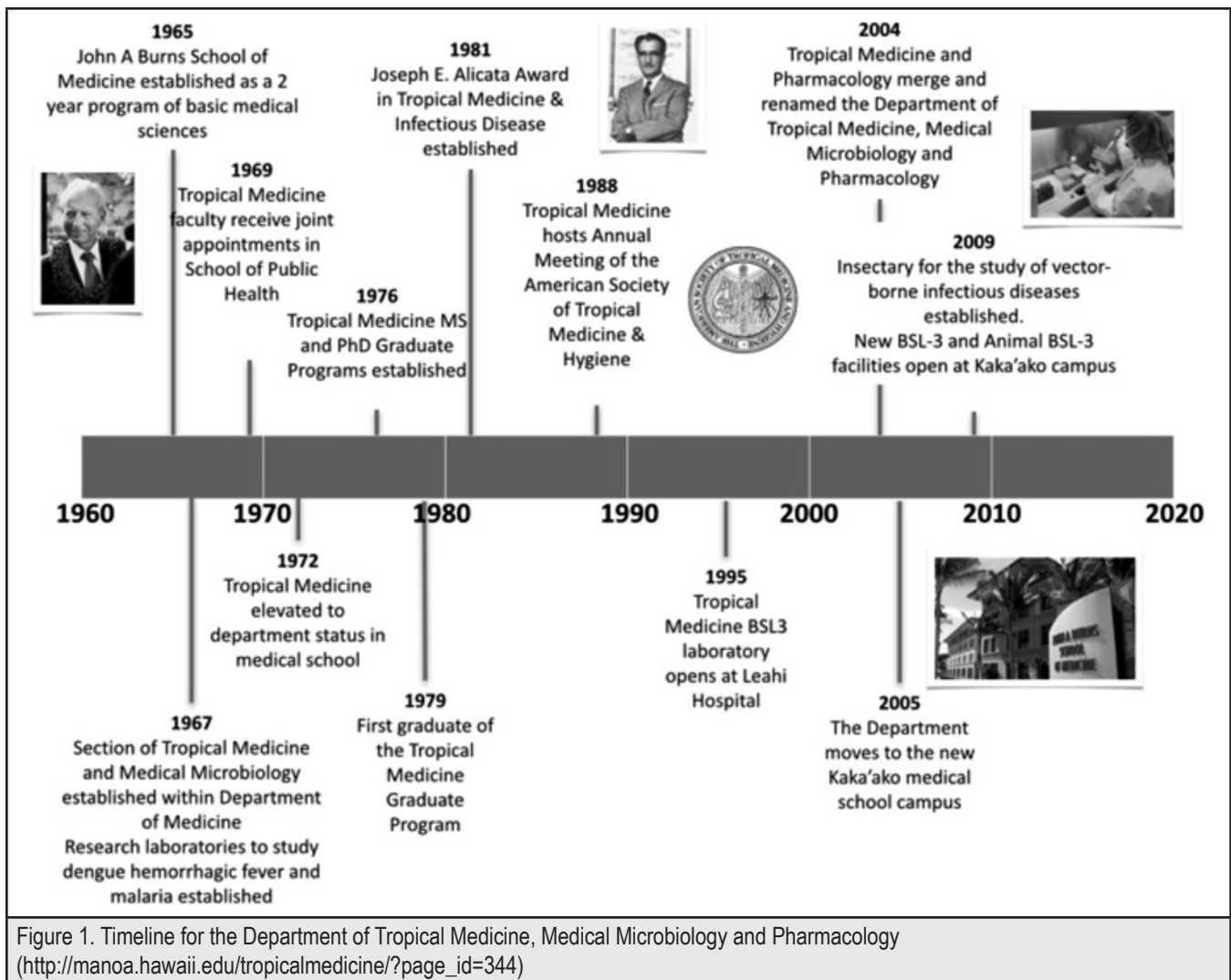


Figure 1. Timeline for the Department of Tropical Medicine, Medical Microbiology and Pharmacology (http://manoa.hawaii.edu/tropicalmedicine/?page_id=344)

be introduced in Hawai'i and the rest of the United States. In addition, the GCertTM program provides training in emerging infectious diseases critical for preparedness in epidemic, pandemic, and maintenance of community health.

In the non-clinical tract, the GCertTM offers an option for post-baccalaureate medical and pharmacy students preparing to obtain a year of advanced biomedical training prior to applying to a professional program.

The GCertTM program is a 9-month program that provides training in infectious diseases to confer a certain degree of competence in the key subjects of bacteriology, mycology, virology, parasitology, laboratory diagnosis and methodology, and immunology. These major content areas as defined by ASTMH are addressed in the course work listed in Table 1. In addition to the coursework, students participate in a seminar course in infectious disease control and complete a capstone project related to their area of interest within the field of tropical infectious diseases.

The courses needed to complete the certificate are available as part of the existing MS and PhD graduate degree programs

at the John A. Burns School of Medicine. While the MS and PhD programs emphasize research training and requires between three to seven years for completion, the GCertTM is a one year program that includes a practicum experience that provides a clearly defined, real-world field experience in the student's area of interest.

To be eligible for enrollment, an applicant must possess a bachelor's degree from a regionally accredited US college or university, or an equivalent degree from a recognized non-US institution of higher education. At minimum, the applicant needs to demonstrate above average academic performance (3.0 - B average or its equivalent) for undergraduate course work and for any post-baccalaureate or graduate course work. Students electing to pursue the clinical track for this program must possess a professional degree in a health science field (MD, Bachelor of Nursing, DVM, PharmD, DO, or equivalent). Applicants whose native language is not English or who have not received an undergraduate or graduate degree in an English-speaking institution will be required to take either the TOEFL or IELTS English proficiency exam as required by UHM.

Table 1. ASTMH Major Content Areas covered by TRMD/PH courses in Graduate Certificate curriculum.
Basic Science and Fundamentals <ul style="list-style-type: none"> • Immunology • Vaccinology • Epidemiology and statistics • Pharmacology • Nutrition
Infectious Diseases <ul style="list-style-type: none"> • Diseases by bacteria, fungi, parasites and viruses
Public Health in the Tropics <ul style="list-style-type: none"> • Maternal child health, breastfeeding • Preventable illness • Chronic diseases and disability • Water supply/waste water management • Sanitation • Community approaches to primary health care • Essential drugs
Epidemiology and Control of Disease <ul style="list-style-type: none"> • Investigation and control of epidemics, disasters, international emergencies
Laboratory Diagnosis <ul style="list-style-type: none"> • Techniques for identifying bacteria, fungi, parasites and viruses • Interpretation of serologic tests • Routine procedures • Molecular diagnosis
Other Diseases and Conditions <ul style="list-style-type: none"> • Nutritional disorders • Environmental stress • Ectoparasites
Travelers' Health <ul style="list-style-type: none"> • Clinical epidemiology and distribution of diseases of travelers and migrants • Pre-travel risk assessment and preventive advice • Available vaccines: indications, dosing, adverse effects • In-travel prevention of food-, water-, soil-, arthropod- and animal-transmitted diseases; self-treatment • Special-needs travelers • Air travel: jet lag, motion sickness, spread of infection, cabin air, on-board care • Medical care abroad • Culture shock and psychological problems • Posttravel assessment and screening • International Health Regulations and Quarantine
Diagnostic and Therapeutic Approach to Clinical Syndromes <ul style="list-style-type: none"> • Cutaneous lesions • Anemia • Acute and chronic diarrhea and other gastrointestinal symptoms • Tropical surgery • Tropical oncology • Mental health in the tropics • Neurologic disease • Ocular disease • Radiologic diagnosis • Urologic symptoms • Manifestations of infection with agents of bioterrorism

The GCert™ program is unique in that it is the only one of its kind accredited by the ASTMH between Texas and Thailand.¹⁰ Currently there is no certificate program in the biomedical sciences at JABSOM despite there being a demand for such programs.

This certificate program is consistent with JABSOM's mission to teach and train high-quality physicians, biomedical scientists, and allied health workers for Hawai'i and the Pacific. Accreditation by the ASTMH assures that courses offered as part of this certificate program will provide a core foundation in tropical medicine and infectious diseases offered through the current graduate degree programs and are consistent with curricular content offered by other highly-regarded academic institutions that offer similar certificates or diplomas in the US and abroad.¹¹

For the JABSOM's MD curriculum, the Tropical Medicine certificate program will help fulfill the Liaison Committee on Medical Education (LCME) requirements for research training and experience for students in the MD program.

7.3 Scientific Method/Clinical/Translational Research

The faculty of a medical school ensure that the medical curriculum includes instruction in the scientific method (including hands-on or simulated exercises in which medical students collect or use data to test and/or verify hypotheses or address questions about biomedical phenomena) and in the basic scientific and ethical principles of clinical and translational research (including the ways in which such research is conducted, evaluated, explained to patients, and applied to patient care).

Conclusion

The GCert™ embodies the essence of the UHM 2011-2015 Strategic Plan, "Achieving Our Destiny." The certificate program touches on each of the four strategic goals, specifically focusing on goals one and three: to increase experimental learning opportunities across curriculum; expand and create transdisciplinary opportunities and programs; and to increase appreciation and understanding of cultural expression in Hawai'i and the Asia-Pacific Rim.

This program also addresses former first lady Michelle Obama's initiative to "train the nation's physicians to meet the unique health care needs of the military and veterans communities," by providing training in infectious diseases that often afflict US troops.¹² JABSOM is one of the 130 institutions nationwide that have committed to this important initiative. The GCert™ contributes to training offered to medical students, medical residents and fellows, and physicians at Tripler Army Medical Center.

The overall goal of the certificate program is to promote health-related career opportunities in the academic, governmental, and private sectors locally, nationally, and internationally.

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INSIGHTS IN PUBLIC HEALTH

Training Today's Students to Meet Tomorrow's Challenges: Undergraduate Public Health at the University of Hawai'i at Manoa

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Insights in Public Health is a monthly solicited column from the public health community and is coordinated by HJMPH Contributing Editors Tetine L. Sentell PhD from the Office of Public Health Studies at the University of Hawai'i at Manoa and Donald Hayes MD, MPH from the Hawai'i Department of Health in collaboration with HJMPH Associate Editors Lance K. Ching PhD, MPH and Ranjani R. Starr MPH from the Hawai'i Department of Health.

Abstract

The University of Hawai'i at Manoa (UHM) has long provided public health graduate education. The University's Office of Public Health Studies (OPHS) has recently started to offer a Bachelor of Arts in Public Health (BA PH) degree in response to the growing need for professionals in the health field. The purpose of this paper is to describe how UHM operates the BA PH and how the program complements OPHS's mission and goals. First, we describe the overall scope of the BA PH within OPHS and within UHM. Then we provide examples of how the BA PH program and past undergraduate student projects align with OPHS's four main goals: (1) education, (2) research, (3) service, and (4) program development.

Introduction

The primary focus of public health is to improve health and quality of life through the population-based prevention and treatment of disease and other physical and mental health conditions, through surveillance of cases and the promotion of healthy behaviors. In 2008, the Association of Schools of Public Health (ASPH) estimated that over 250,000 public health workers will be needed in the United States by 2020.¹ Public health workers are a multidisciplinary labor force that includes health program administrators, researchers, planners, policy analysts, epidemiologists, biostatisticians, program administrators, environmental health specialists, and more. The ASPH anticipated the retirement of 110,000 public health professionals and the need for qualified replacements. They also anticipated the need for new healthcare positions to coincide with the rising incidence of chronic disease and the subsequent need for more interventions and research.¹ In addition to workforce needs, the Institute of Medicine (IOM) has emphasized the importance of public health knowledge among US citizens, as issues like climate change and Zika gain importance and relevance. Thus, the IOM recommended accessible public health education for all undergraduate students.²

The health care field is growing generally. In 2014, there were nearly 20 million jobs in the health field, which accounted for more than 13% of the nation's total workforce.³ The federal Bureau of Labor Statistics' (BLS) estimated that the health field employment rate grew faster than the rate of employment in all other sectors during the time period between 2004 and

2014. Within the field, public health professionals function broadly—positions include surveillance, administration, regulation, promotion, delivery, evaluation, and many other duties that support national healthcare.³ The BLS predicted that the subsequent decade will have a 60% increase in healthcare jobs, making it the fastest-growing occupation.³

Traditionally, public health training has been at the graduate level, particularly with the Masters in Public Health as the core degree. Yet many previous publications⁴⁻⁷ have identified the importance of public health education at the undergraduate level and emphasized the need for engaged citizens to emerge as future health professionals.⁸ Further literature supports the introduction of education in health promotion as early in academic training as possible, then broadening concepts of prevention over time.⁹ The report¹⁰ additionally emphasizes the value of integrating both an emphasis on practice and a liberal arts framework into public health undergraduate curriculum.

For these reasons, in 2014, the Office of Public Health Studies (OPHS) at the University of Hawai'i at Manoa began offering a Bachelor of Arts in Public Health (BA PH) degree. This initiative was in response to local demand for, and national trends in, public health training. The development of BA PH programs was further supported by the Council on Education for Public Health (CEPH), the nationally recognized accrediting body for public health schools and programs.⁵ OPHS is accredited by CEPH, and has aligned its goals based on specific criteria set by this national accrediting organization. Among a range of criteria, CEPH specifically requires BA PH degrees to provide both a general and public health-specific educational foundation in science, behavioral studies, and statistics, and mandates demonstration of public health skills (eg, written and oral communication), as well as cumulative and experiential activities.

For more than 50 years, the University of Hawai'i at Manoa (UHM) has provided graduate training in public health, first as the School of Public Health and now as the OPHS. Since the first graduating class in 1967, more than 7,000 individuals have earned an MPH, MS, PhD, or DrPH in public health. The addition of the BA PH degree has helped attract more students into the field by raising awareness of public health as a career

choice. Having a BA PH degree prepares students to enter the public health workforce more quickly and builds a pipeline into graduate public health training. For students interested in other professions, such as medicine, nursing, law, and business, a BA PH provides a solid foundation in education about individual, community, and global health.

The purpose of this paper is to describe how UHM operates the BA PH and how this program aligns with OPHS's mission and goals. We will describe the overall scope of the BA PH within OPHS and within UHM. Then we provide examples of how the BA PH program responds to OPHS's four main goals: (1) education, (2) research, (3) service, and (4) program development. Undergraduate student projects contribute to these goals; in this paper we provide examples for each of the four goals.

Bachelor of Arts in Public Health at the University of Hawai'i at Manoa: Overall Scope

The primary goals of the BA PH degree are to (1) meet the needs of the public health community, locally and globally, (2) to prepare undergraduate students for successful careers in the public health workforce, and (3) to prepare students for transition into graduate degree programs. There are multiple levels of BA degree requirements due to various UHM and CEPH requirements. This paper focuses on a major milestone on the pathway to graduation, the Applied Learning Experience (APLE). However, there are many other areas for reinforcement/mastery throughout the undergraduate curriculum. Coursework is open to students across campus, specifically through the introduction to public health class, which additionally serves to expose university students to public health as a discipline and career pathway. This introductory class provides general education in the form of required diversification in social science (DS) credit. There are no pre-requisites for the introductory class, and in many ways it is used as a gateway to prepare students for further courses in public health. Within UHM, students entering the undergraduate public health program are either new students to the university, or began their college careers in pre-nursing or as exploratory (undeclared) students.

The BA PH program is an option for students interested in diverse health care options and specific health care graduate programs (including medical school or graduate-level nursing). In articulation with graduate education, public health graduate degrees provide specialization-specific education and skills training, while the BA PH provides a broad exposure and macro-scale preparation for future careers in health. As such, a bachelor of arts degree in public health is both a meaningful degree on its own, but also a strong complement to another degree in health care.

Mission and Goals of Office of Public Health Studies

The mission of OPHS is "to advance the health of the peoples of Hawai'i, the nation, and the Asia-Pacific region through

knowledge, discovery, innovation, engagement, inclusion, and leadership".¹¹ Preparing students for future occupations in a wide array of exciting career fields within public health is a critical objective for the BA PH. The BA PH is designed to educate undergraduates interested in public health and/or health profession training in the basic concepts of public health education, practice, and research. The BA PH also helps meet the departmental goals: education, service, research, and program development. Specific goals and examples of how they are met are provided below.

Education Goals

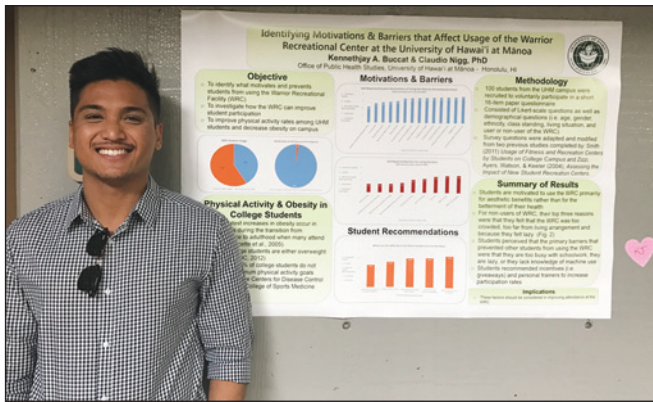
- To recruit and retain a diverse and qualified student body.
- To offer required and elective courses and practicum experiences that facilitate student mastery of public health competencies.
- To assure graduates master the core competencies of their degree.
- To offer a broad variety of public health practicum opportunities, with a focus on Hawai'i, the Pacific, Asia, and Indigenous peoples.¹¹

The educational goals of OPHS highlight diversity and emphasize skill mastery through coursework and experiential activities. UHM is uniquely situated to serve diverse Asian and Pacific populations, which should also be reflected in the student body. The OPHS Diversity Plan and Recruitment Policies and Procedures identifies priority areas and establishes specific strategies which guide OPHS student, faculty, and staff representatives in efforts, both on-campus and off-campus, to recruit and enhance the diversity of our student body and faculty. Specifically, recruitment efforts target local high school students and seek to promote awareness of public health jobs and degrees. The program hopes students from Hawai'i and the Pacific will be inspired to return to their communities after graduating and join the local public health workforce.

The BA PH degree program provides coursework and experiential opportunities that facilitate student mastery of public health competencies. The primary opportunity for experiential learning is through the APLE, a required service-learning/research project for BA PH students. Students are required to participate in the OPHS Undergraduate Summit, a public forum where junior-level students present project proposals for their APLE and seniors share their completed projects as academic posters. Coursework complements these efforts through three introductory core courses, in three ways: (1) providing new, incoming undergraduate public health students with a strong foundation in core public health knowledge; (2) exposing students to both a breadth of public health principles, and a depth in application of those principles to a local and global health setting; and 3) initiating the development of written and oral communication skills as a foundation of an undergraduate degree program. There are additionally public health course requirements focused on public health biology and an introduction to

epidemiology, as well as opportunities for students to diversify their public health education through elective coursework.

Kennethjay Buccat is an example of an undergraduate student whose project served the needs of the local, on-campus community. As an undergraduate who graduated from Campbell High School, Mr. Buccat developed an interest for working to improve health and physical activity among his college peers. His undergraduate APLE identified the factors that affect the usage of the Warrior Recreational Center at the University of Hawai'i at Manoa, which opened to UH Manoa students in the fall 2015. Specifically, Mr. Buccat conducted a quantitative assessment of current undergraduate students and identified barriers to their use of the on-campus Warrior Recreation Center. He worked on this project in collaboration with physical activity researcher and public health faculty member, Dr. Claudio Nigg.



Kennethjay Buccat presenting final poster at the OPHS Undergraduate Summit on December 2016.

Service Goals

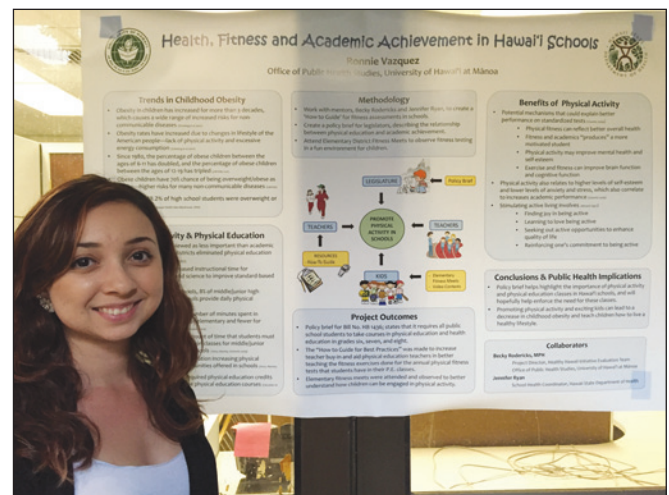
- To be an active partner in providing continuing education to the public health workforce in Hawai'i.
- To provide consultative and direct services to community, state, federal, and international organizations in support of the program's mission.¹¹

Service-learning is crucial for comprehensive public health education as a form of experiential learning that values social justice and community collaboration. The authors explain, "while relatively new to public health, service-learning has its historical roots in undergraduate education and has been shown to enhance students' understanding of course relevance, change student and faculty attitudes, encourage support for community initiatives, and increase student and faculty volunteerism."¹² Service learning is a key component to the BA PH, and is inte-

grated into the curriculum during several courses. For example, PH 202 (Public Health in Hawai'i) requires students to identify examples of public health in their local communities through photographs, and separately, to participate in an 'Aina (Land) Connection Experience, which promotes a hands-on understanding of Hawaiian values and culture while working in a local community setting. Service learning is also a major component of the APLE, which is also referred to as the undergraduate capstone, as described in the report.¹³⁻¹⁴

Three classes make up the capstone series for undergraduates, which foster critical thinking and facilitate students' real-world application of public health knowledge. The capstone series guides students over the course of three semesters as they develop an interdisciplinary applied learning project, which they execute and present under the guidance of a mentor. The first course, PH 480, introduces students to a range of Public Health programs and projects. In this class the students develop their own project and initiate a proposal. Students also learn how to write a resume and learn basic research methodology. The second class, PH 485, guides students through the APLE. Students create a memorandum of agreement with a mentor and monthly blogs about their progress. Students also have opportunities to meet with faculty and an advisor for support. In the final course, PH 489, students finalize and present their APLE projects. Students practice written and oral communication in class and in the field. This capstone gives students the opportunity to receive training and gain applied, real-world experience that they can prepare them for employment or graduate school.¹³⁻¹⁴

Ronnie Vazquez is an example of an undergraduate student whose project focuses on collaboration between the University of Hawai'i at Manoa and other agencies throughout the state. After attending Kapolei High School, Ms. Vazquez graduated in December 2015 with her Bachelor of Arts degree in Public



Ronnie Vazquez presenting final poster at the OPHS Undergraduate Summit on December 2015.

Health and minor in Spanish, with Honors, and is currently transitioning towards a clinical career in nursing. Throughout her APLE, she demonstrated an interest and passion for improving wellbeing and physical activity among youth through a project centered on Health, Fitness, and Academic Achievement in Hawai'i. She worked on this project in collaboration with the Healthy Hawai'i Initiative program and their evaluation team through the Hawai'i Department of Health. In her work for the project she attended fitness meets, spoke with physical education teachers, reviewed the literature, helped film techniques needed to conduct fitness testing in order to create an instructional guide, and created policy briefs for legislators. Her contributions demonstrated a very practical application to address state-level health policy, increase student engagement in physical activity, and support teachers through the Hawai'i Department of Education. Deliverables from her project are currently being shared with policymakers in the state, as well as being used by the Hawai'i Departments of Health and Education to help communicate the importance of childhood obesity and physical activity opportunities in the school setting.

Research Goals

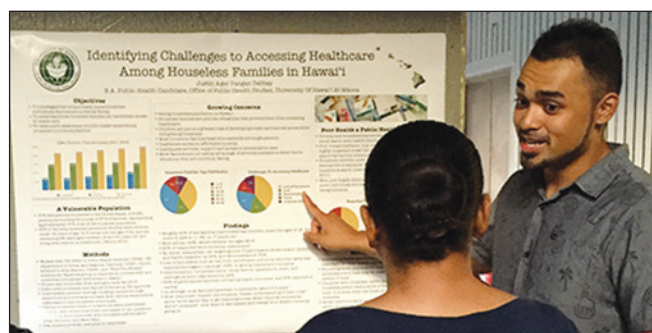
- To discover and create new knowledge, evaluate health service needs, and apply research with an emphasis on Hawai'i, the Pacific, and Indigenous peoples.
- To disseminate research findings through publications and participation in local, national and professional societies.
- To involve students as active participants in research and evaluation projects.¹¹

OPHS is currently accredited by the Council on Education for Public Health (CEPH). CEPH accreditation criteria for undergraduate programs include a requirement to provide foundational knowledge for research.¹⁵ The BA PH courses incorporate these criteria, while also providing diverse perspectives through electives on Indigenous health and other topics of local importance.

Students further apply this research foundation to their APLE, where they begin applying research and service-learning skills. One of the first tasks they complete for their capstone is a written project proposal, including a literature review, on a public health topic of interest. This contributes to the synthesis of knowledge, as students are encouraged to explore issues of local relevance. After completing their proposed projects under the supervision of an approved mentor, they return to the classroom in a subsequent semester to write up their final results, outcomes, and experiences in a final report. The APLE meets OPHS research goals in two ways: (1) under mentorship students participate in research and evaluation both locally and abroad; and (2) students gain experience writing and presenting their research in public and private settings. Students also create academic posters of both their proposals and final projects, and present their posters during the OPHS Undergraduate Summit, a public on-campus forum, during respective semesters.

Following presentation at the OPHS Undergraduate Summit, students have used their completed posters to share information at academic and professional conferences and with community organizations, both locally and abroad.

Justin Tabbay is one example of an undergraduate student whose project applied the OPHS research goals. An alumnus of Farrington High School, Mr. Tabbay graduated with his BA PH in December 2015 and is currently a graduate student in an accelerated nursing degree program. Throughout his time in the BAPH program he demonstrated an interest and commitment for working with disadvantaged populations, particularly houseless/homeless populations. His undergraduate APLE focused on a qualitative investigation of access to health and barriers to health care resources among houseless/homeless populations on O'ahu. His findings have been shared at public forums and are currently in preparation for publication in an academic, peer-reviewed journal.



Justin Tabbay presenting final poster at the OPHS Undergraduate Summit on December 2015.

Program Development Goals

- To ensure academic excellence by systematically evaluating the program and incorporating findings in program development.
- To ensure academic excellence by garnering adequate resources for delivery of a quality public health program.
- To improve the abilities of faculty, staff, and students to work with diverse populations.¹¹

OPHS trains faculty members to mentor, advise, and teach undergraduate students. OPHS faculty are encouraged to serve as APLE mentors, but other UHM faculty and community leaders are also appropriate candidates for mentorship. APLE mentors provide learning opportunities that employ students in research projects or program activities.¹³ The BAPH curriculum guides students through the APLE by incorporating the skills and knowledge necessary for a smooth transition into graduate programs or the public health workforce. An emphasis is placed upon quantitative skills, written communication skills, community engagement, oral communication skills, and hands on experience within the public health field. Life skills such

as organization, professionalism, and resourcefulness are also incorporated into public health coursework and experiences.

Aprilei Ramirez is an example of an undergraduate student whose project focused on collaboration and mentorship. As a graduate of the Farrington High School Health Academy, Ms. Ramirez developed an interest in public health and improving nutritional access among youth. Working in collaboration with Farrington High School youth, her APLE focused on utilizing Photovoice, an emergent, qualitative, and participatory methodology, to engage adolescents living in the Kalihi area in sharing their perspectives on healthy eating and the local food environment.¹⁶ This project is additionally an example of faculty mentorship, as the study was conducted under the guidance of OPHS faculty member and experienced Photovoice expert, Dr. Vanessa Buchthal. Following graduation with her BAPH, and minor in Ilokano, in May 2016, Ms. Ramirez has continued on to seek her Masters in Public Health degree, specializing in Social and Behavioral Health Sciences, from the University of Hawai'i at Manoa's Office of Public Health Studies.



Aprilei Ramirez presenting at the HPHA Conference on October 2015.

Conclusion

The creation of the BA PH responds to local and national demand for a diverse health workforce.^{1-3, 17} Offering a BA PH program at UHM serves to increase awareness of public health occupations early in the academic careers of undergraduate students. Efforts have also been consistently made to develop an undergraduate curriculum that expands public health educational capacity at UHM and aligns with current OPHS departmental goals in the areas of education, research, service, and program development. OPHS strives to provide students in the program the knowledge, tools, and skills necessary to successfully gain entry into the public health workforce or entry into graduate programs. To date, there are an estimated 160 declared Public

Health majors, and the program has graduated 55 BA PH students since its inception. Recent graduates have progressed to graduate programs in public health and nursing, have gone on to participate in service projects abroad, and have transitioned into entry-level positions in a variety of health-related disciplines. It is the hope of the program that through provision of bachelor-level public health education, graduates will go on to improve the health of our local communities and state overall.

Acknowledgements

We would like to acknowledge the Bachelor of Arts in Public Health graduates who shared their work in this paper: Kenneth Jay Buccat, Aprilei Ramirez, Justin Tabbay, and Ronnie Vazquez. We also gratefully acknowledge their mentors: Dr. Opal Vanessa Buchthal, Dr. Claudio Nigg, Rebekah Rodericks, & the Healthy Hawai'i Evaluation Team. Much appreciation also to Dr. Kathryn Braun, Dr. Robert Cooney, and Michelle Tagorda for their contributions to undergraduate program development.

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THE WEATHERVANE

RUSSELL T. STODD MD; CONTRIBUTING EDITOR

IT'S JUST A BROKEN HIP. HE CAN WAIT TILL TUESDAY...NOT!

For an elderly person, a fractured hip may be a sentence of death. At least 1/3 of such patients die within one year, and fewer than one in five return to their previous level of activity. Now a new approach to such problems may possibly improve the outlook. The established method of placing such patients in bed and sedated for three days or more before operating to assure stability, may be at fault. An estimated 340,000 older adults suffer hip fractures in the United States annually, and many have other medical issues. Because physicians and orthopedists have taken the position that fractures are not real emergencies, operations are often delayed. Now more hospitals are putting hip fracture patients on a fast track for surgery from the emergency room to the OR, repairing the fracture within six hours or so. A review of more than 2 million patients led by a team at NYU Langone Medical Center's Department of Orthopedic Surgery published last year in the Journal of Orthopedic Surgery found that compared with same-day surgery, each day of delay was associated with a significantly higher overall complication rate. Surgery two or three or more days after admission was associated with higher rates of death. "We have to start thinking differently, and treat a hip fracture with the same urgency as a heart attack or a stroke," says Philip Devereaux, cardiologist and researcher at McMaster University in Hamilton, Ontario. Delays can cause the physical trauma of a fracture to stimulate inflammatory responses in the body. That will increase stress on the heart and the immune system which will increase the risk of complications. A pilot study in 2013 published in the Canadian Medical Association Journal suggested that accelerated surgical patients had a 40% lower risk of major complications. The current mantra for physicians and orthopedists should be "Get the fracture patient to the OR. Get him/her up and moving after surgery." 75% of such patients return to independent living.

ORGANIZED MEDICINE NEEDS A HAMMER.

A study published in the New England Journal of Medicine reported what insurance companies have known for years; 1% of physicians accounted for 32% of paid malpractice claims over the past 10 years. While this might appear to be good news since almost all doctors can be trusted to meet the acceptable standard of care, but the ugly truth is little is being done to hold the bad doctors accountable. The new study analyzed more than 66,000 claims paid against 54,000 physicians between 2005 and 2014. The small number of bad docs showed "distinctive characteristics," implying they can be identified at an early stage. Put another way, health care providers could eliminate 1/3 of medical malpractice — along with patient pain and suffering, cost of corrective surgeries, long term care and indemnity payments. So, why not identify and punish the bad docs? Restrictions built into the National Practitioners Data Bank prevent identifying the doctors by name. Only in Colorado is medical malpractice a matter of public record. Shielding the very worst doctors not only harms patients, it also casts a shadow on the vast majority of competent, careful and caring physicians. Talk to your state legislators and open the windows.

YOUR PHONE COULD BE A TATTLETALE.

Your cellphone can become a treasure trove of information for a forensic expert. The smudges on your phone reveal intimate details about your life style, a new study from the University of California in San Diego reports. Traces of molecules and microbes left when you handle the phone can add up to a composite portrait, including gender, diet, medications, clothing, beauty products and even places visited. The new technique reported in the Proceedings of the National Academy of Sciences is not yet admissible in court, nor is it precise enough to identify a single person like a fingerprint or a DNA sample. Still, it has the potential to help investigators use objects found at a crime scene to narrow the range of possible suspects. Existing forensic techniques have come under criticism recently: bite marks, hair and

tool-mark analysis, fail to meet scientific standards. Now experts have a new and more reliable source. No doubt this technique will expand with technology.

OVER THE HILLS AND THROUGH THE WOODS TO THE MESS LAB WE GO.

When a 58-year-old man collapsed and died at a convenience store in eastern Montana in August 2016, his body had to be driven 300 miles to South Dakota for autopsy. The problem is the dearth of medical examiners (forensic pathologists) across the United States. "There is a shortage," said David Fowler, vice president of the National Association of Medical Examiners. There are about 500 practicing board-certified forensic pathologists, less than half the number required. While television stories make the work appear interesting and rewarding, that is rarely the case. It is not glamorous, not attractive and doesn't pay much. Moreover, the corpse may be several days old and a challenge to the olfactory sense. The shortage also means that some autopsies are performed by people who are not forensically trained. The US Justice Department in 2013 approved recommendations to increase the number of forensic pathologists by raising salaries, introducing student-loan forgiveness and increasing exposure to the profession in medical school. So far, programs are undersubscribed, and the annual number getting board-certified has remained between 30 and 40 for the past 10 years.

SHE IS BEAUTIFUL AND SHE IS STRONG.

Television personality Erin Andrews, hostess of "Dancing With The Stars" and sideline commentator of National Football League (NFL) games had recent surgery for cervical cancer. She is a survivor and not giving up her roles with Fox network. The positive side of her experience is the notoriety for the 13,000 women who die with the disease each year. Cervical cancer is readily preventable with use of the HPV vaccine, but the downside is the relative lack of vaccine acceptance in this country. All 69 of the nation's National Cancer Institute-designated centers urged parents and health-care providers to have children complete the regimen by their 13th birthday. Just 40% of girls and 21% of boys have received the vaccine according to the Centers for Disease Control and Prevention (CDC). The US rates stand in marked contrast to some other countries, including Australia at 75% of boys and girls, the United Kingdom at between 84% and 92% and Rwanda where 93% of children are in compliance with World Health Organization recommendations for HPV shots.

IN VINO VERITAS.

An elderly woman was sitting on the lanai and sipping a glass of wine. She said, "I love you so much I would not want to live without you." Her husband sitting beside her said, "Is that you or the wine talking?" She replied, "It's me, talking to my wine."

ADDENDA

- One-third of the entire population of Sweden emigrated to the United States in the 1800s.
- Woodrow Wilson was the last president to type all his own letters.
- Old people should not eat health foods. They need all the preservatives they can get.
- Most people don't know what they are doing, and a lot of them are really good at it.
- Kinky sex involves the use of duck feathers. Perverted sex involves the whole duck.
- Death sneaks up on you like a windshield sneaks up on a bug.

ALOHA AND KEEP THE FAITH *rt*s

(Editorial comment is strictly that of the writer.)

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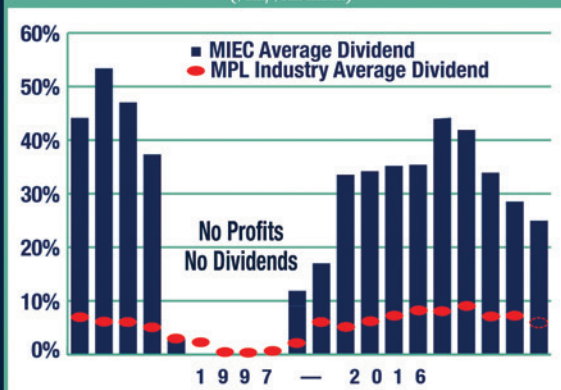
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