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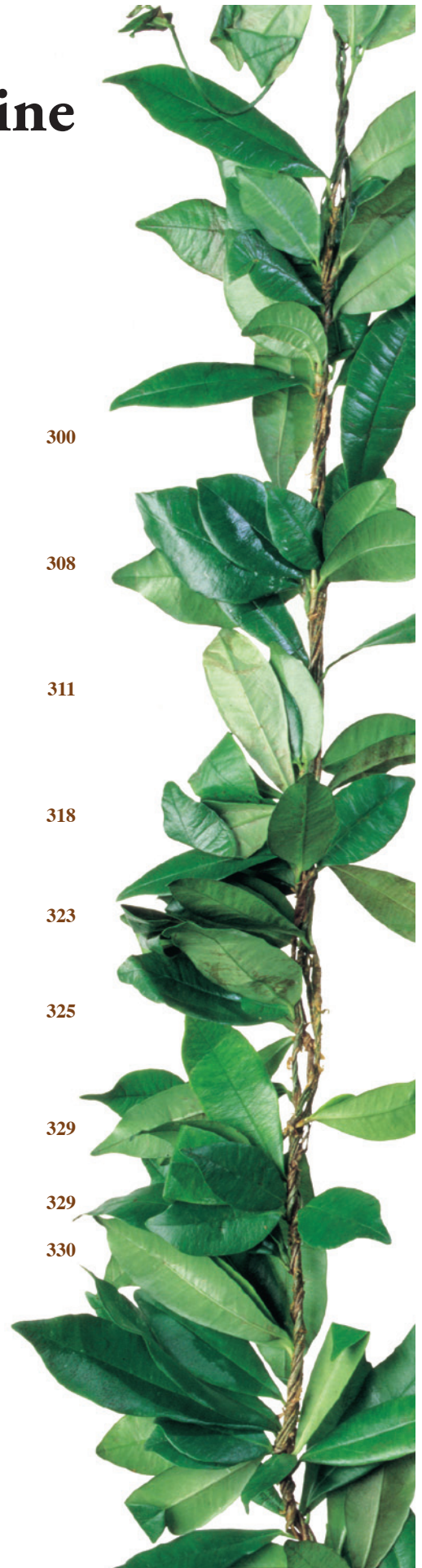
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Factors Affecting Healthy Eating and Physical Activity Behaviors Among Multiethnic Blue- and White-collar Workers: A Case Study of One Healthcare Institution

Jodi H. Leslie DrPH, RD, LD; Kathryn L. Braun DrPH; Rachel Novotny PhD, RD; and Noreen Mokuau DSW

Abstract

Worksite health promotion programs can reduce prevalence of chronic disease among employees, but little research has been done to discern whether they meet the needs and incorporate the preferences of workers of different occupational types. The objective of this study is to examine differences in influences to healthy eating and physical activity and preferences for programs among multiethnic blue- and white-collar workers in Hawai'i. A total of 57 employees from a major health care corporation in Hawai'i participated. A mixed-methods approach was employed, in which findings from focus groups with white-collar workers (WCW) (n=18) were used to inform development of a questionnaire with closed and open-ended items for use with blue-collar workers (BCW) (n=39), whose jobs did not provide adequate time to participate in focus groups. Focus groups with WCW revealed that onsite availability of healthy food and fitness opportunities provided the most support for healthy eating and physical activity at work; work demands, easy access to unhealthy foods, and lack of onsite fitness opportunities were barriers; and lifestyle management was a topic of substantial interest. BCW cited the ability to bring home lunch and their (physically active) jobs as being supportive of healthy behaviors; not having enough time to eat and personal illness/injury were barriers; and chronic disease topics were of greatest interest. Knowing differences in influences to healthy eating and physical activity, as well as preferences for worksite wellness programming, among BCW and WCW, is important when planning and implementing worksite health promotion programs.

Introduction

Studies suggest that blue-collar workers (BCW), as defined by the US Department of Labor, are more likely than white-collar workers (WCW) to have risk factors for chronic disease.¹⁻¹⁰ Factors related to these health risk behaviors have been attributed to the demographic characteristics of BCW (eg, low education level, being an ethnic minority) and the nature of blue-collar jobs (resulting in burnout, stress, and job dissatisfaction), and subsequent increased risk of myocardial infarction and depression.¹¹⁻¹⁶

Characteristics of white-collar jobs can also contribute to adverse health outcomes among WCW. WCW have more sedentary jobs than BCW.^{17,18} Additionally, white-collar jobs, though less physically demanding than blue-collar jobs, tend to be more psychologically demanding.¹⁹ Low physical activity levels and high psychological stress are two risk factors for obesity, and obesity is also a risk factor for chronic disease.^{20,21}

Studies in Europe have estimated that 30% of total mortality and 30% of total loss of disability-adjusted life years can be prevented through workplace health promotion and protection activities.²² While not much can be done to change the characteristics of blue- and white-collar jobs, providing appropriate and adequate health education and care opportunities, through worksite health promotion programs, may help to alleviate the health burden that these jobs entail.

In developing wellness programs in worksites with both WCW and BCW, it is important to first learn what factors are related to the likelihood of practicing healthy eating and physical activity behaviors at work and how to meet the differing needs and interests of both. Thus, the purpose of this study was to examine supports and barriers to healthy eating and physical activity and preferences for programs among WCW and BCW in Hawai'i.

Methods

The setting for this 2011 study was a major health care corporation in Hawai'i, which employs about 5,100 individuals statewide. The research utilized a mixed-methods approach, which included focus groups with WCW and a survey of BCW.²³ This method was chosen when it became apparent that the jobs held by the BCW would not allow them enough time to participate in a traditional focus group, as they were allotted only 20 minutes of work time to participate in the study. Thus, the findings from the WCW focus groups were used to inform the development of a survey for BCW. The same incentives were provided to all participants. This study was approved by the University of Hawai'i Institutional Review Board and the Queen's Medical Center Research & Institutional Review Committee.

Focus Group Questions

The study framework was informed by a previous study on policy development and environmental changes to promote physical activity, done by Sallis, et al,²⁴ which was expanded to include healthy eating. The framework addressed three areas: (1) availability and access; (2) desired education, programs, and incentives; and (3) acceptable measures of determining positive health changes that were addressed by nine focus group questions: (1) What things in your work environment support you in making healthy eating choices?; (2) What things in your work environment hinder you in making healthy eating choices?; (3) What things in your work environment support you in being physically active?; (4) What things in your work environment hinder you in being physically active?; (5) What educational programs could be held at the worksite to promote healthier eating and getting regular exercise?; (6) What other kinds of programs could be held at the worksite to promote healthier eating and getting regular exercise?; (7) What incentives might help you to make healthier choices?; (8) What kinds of things can we measure to see if employees are getting healthier?; and, (9) What kinds of things could we measure to see if the worksite is becoming healthier? The focus group methods and

questions were tested in a previous worksite study by Leslie, et al,²⁵ where they were found to be acceptable with a mixed-ethnic population in Hawai'i, and useful in obtaining information for planning future worksite wellness programs.

BCW Survey

A survey was developed for BCW to reflect the nine focus group questions and used response options derived from findings from the focus groups with WCW. Opportunity was provided for other write-in responses to the questions. This allowed a comparison of themes generated from the WCW groups with results from the BCW survey. Providing response options was useful given the short time BCW had available to respond to each question.

Background Questionnaire

Each participant (both BCW and WCW) was asked to anonymously complete a background questionnaire, adapted from Leslie, et al,²⁵ which solicited demographic and other information: age, gender, ethnic group most identified with, highest amount of schooling completed, job title, number of years in current job position, current self-reported weight and height, perceived weight status (underweight, need to lose 10-20 pounds, need to lose 20 or more pounds, or just right), and perceived level of exercise (just right, need to increase, or too high). Additional questions regarding self-reported personal and family history of and risk for chronic diseases were included, in order to examine other differences in health characteristics of BCW and WCW.

Recruitment of WCW and BCW Participants

Participants, for both the BCW survey and WCW focus groups, were deemed eligible if they were 18 years or older and were an active employee of the organization.

WCW participants were recruited by a letter and accompanying recruitment flyer, which was electronically sent from the IT department via the company's listserv a single time. Interested employees contacted the project coordinator directly. A total of 18, of the 3,863 WCW on the listserv (<1%), participated in the four focus groups; 17 completed the survey.

BCW participants were solicited by their managers (n=4, company wide), as the BCW did not have access to email. Managers of BCW, who were interested in having their employees participate (n=1), contacted the project coordinator. A total of 39 (17%) of the agency's BCW (n=227) participated in the survey.

WCW Focus Group Methods

The four WCW focus group sessions were held onsite and lasted approximately 70 minutes each. The same facilitator, trained in focus group facilitation, conducted all four focus group sessions. Participants provided their responses to each of the focus group questions described earlier. Discussion was digitally recorded, with the main ideas recorded on Power Point and projected on a wall screen viewable to all participants, to ensure that responses were accurately recorded. Participants completed the background survey prior to the start of the focus groups.

BCW Survey Methods

A hard copy of the survey was provided to the BCW participants, onsite, during a regularly scheduled staff meeting. The project coordinator read each question and then allowed time for participants to write their answers. Participants completed their background questionnaire and survey separately and anonymously.

Data Analysis

Focus group recordings were transcribed, transcriptions were coded, and common themes were extracted using QSR NVivo 9. Following methods for constant comparative analysis, themes were examined, compared, and assigned into the following categories: (1) supports; (2) barriers; (3) ideas for programming; (4) incentives; and (5) acceptable evaluation methods.^{26,27} Themes within each category were reexamined and compared, and re-categorized (if determined to be appropriate), and irrelevant or extraneous information was taken out. These themes became response options for the nine questions in the BCW survey.

Frequencies of responses from the BCW survey and the background questionnaire were manually generated. None of the BCW wrote in additional responses, so no original BCW themes were generated. Self-reported weights and heights were used to calculate participant's Body Mass Index (BMI), which was categorized using the US BMI classification.²⁸

Results

Demographic and Health Characteristics of WCW and BCW

Although 57 employees participated in the study, demographic and health data were only provided by 54 participants; two questionnaires were largely incomplete (both BCW) and one was not completed at all (from WCW). Since not every respondent answered every question, slight differences in total number of responses by question are seen (Table 1).

A majority of BCW were female (77%), Filipino (89%), 50-69 years old (64%), and had a high school education or less (54%). The majority of WCW was also female (76%), but they were younger (71% were 40-59 years old), and had a 4-year college degree or higher (83%). The most common ethnicity of WCW was White (38%), followed by Japanese and Filipino (tied at 19%).

Slightly fewer BCW than WCW were classified as overweight or obese (47% vs 53%). BMI categorical distributions were more likely to concur with self-rated weight status among BCW than among WCW, with 76% of WCW saying that they needed to lose 10+ pounds when in fact only 53% were overweight/obese by BMI.

High blood pressure (38%) and high cholesterol (27%) were the most common health conditions reported by BCW; high blood pressure (29%), high cholesterol (12%), and obesity (12%) were the most commonly reported among WCW. Family history of chronic disease and risk factors for chronic disease were reported more frequently among WCW than BCW.

Table 1. Number and Percent of WCW Focus Group and BCW Survey Participants, By Sociodemographic Variables ^a						
	BCW (n=39)		WCW (n=18)		Total (N=57)	
	n	%	n	%	n	%
Age	n=36		n=17		n=53	
20-29	0	0	1	6	1	2
30-39	6	17	3	18	9	17
40-49	7	19	8	47	15	28
50-59	12	33	4	24	16	30
60-69	11	31	1	6	12	23
Gender	n=30		n=17		n=47	
Male	7	23	4	24	11	23
Female	23	77	13	76	36	77
Ethnicity	n=35		n=16		n=51	
Filipino	31	89	3	19	34	67
White	0	0	6	38	6	12
Japanese	0	0	3	19	3	6
Chinese	3	9	1	6	4	8
Native Hawaiian	0	0	2	13	2	4
Hispanic	0	0	1	6	1	2
Other	1	3	0	0	1	2
Educational Attainment	n=33		n=17		n=50	
Elementary	4	12	0	0	4	8
Some high school	6	18	0	0	6	12
High school/GED	8	24	0	0	8	16
Some college/tech	5	15	2	12	7	14
Tech school/2 yr degree	4	12	1	6	5	10
College grad/4 yr degree	4	12	4	24	8	16
Graduate or higher	2	6	10	59	12	24
Body Mass Index (BMI)	n=36		n=17		n=53	
<18.5 (underweight)	0	0	0	0	0	0
18.5-24.9 (normal weight)	19	53	8	47	27	51
25-29.9 (overweight)	13	36	6	35	19	36
>=30 (obese)	4	11	3	18	7	13
Self-rated Weight Status	n=36		n=17		n=53	
Underweight	2	6	0	0	2	4
Just right	19	53	4	24	23	43
Need to lose 10-20 pounds	14	39	7	41	21	40
Need to lose 20+ pounds	1	3	6	35	7	13
Self-rated Exercise Level	n=30		n=16		n=46	
Just right	14	47	1	6	15	33
Need to increase	15	50	15	94	30	65
Too high	1	3	0	0	1	2

^aBlue-collar worker (BCW); white-collar worker (WCW); number of observations (n); Contains differential n for each variable as not all questions were answered by respondents.

Table 2. Number of WCW Focus Groups and WCW Participants Addressing Themes Related To Healthy Behaviors at Work^a

	# of groups addressing theme	# of people addressing theme
Supports to Healthy Eating		
Access to healthy food	4	8
Coworkers	3	4
Onsite nutrition information	4	5
Job characteristics & benefits	2	2
Supports to Physical Activity		
Coworker support	3	4
Access to fitness opportunities	3	7
Physical layout of facility	2	3
Job characteristics (involves active movement)	2	2
Supportive manager	1	1
Barriers to Healthy Eating		
Low access to healthy foods	4	9
Work demands	3	11
Coworkers	3	4
Barriers to Physical Activity		
Low/no access to fitness opportunities or equipment	3	8
Work demands	4	7
Job characteristics	1	2
Unsupportive manager	1	1
Wellness Programming		
Education on different disease and health topics	4	10
Health education materials	2	6
Employer-sponsored wellness activities	4	8
Employee-lead wellness activities and programs	2	2
Access to fitness opportunities and related programs	2	6
Having programs at different times throughout day	3	7
Incentives		
Freebies or discounted items	4	6
Points rewards system	4	9
Administrative role models	1	2
Worksite policy changes	2	7
Suggested Evaluation Measures		
Observations of the environment	4	9
Objective measures (weight, blood pressure, etc.)	4	7
Human resources data	3	5
Subjective measures	2	4

^aWhite-collar worker (WCW). WCW responses based on total of 4 full-length focus groups done and 18 focus group participants.

WCW Focus Groups (Table 2)

Supports to Healthy Eating and Physical Activity

Access to healthy food, such as salad bars and vegetarian options in the cafeteria, healthy “grab and go” items at the onsite café, and the availability of kitchen appliances to store and prepare foods were reported to help WCW make healthier choices. Access to fitness opportunities (50% of WCW respondents), eg, having the ability to take the stairs and the availability of both employee-paid and free classes, eg, hula, aerobics, yoga (depending which motivated the employee more) were also helpful. Co-workers who practice healthy behaviors (eg, walk during lunch, take the stairs vs elevator, eat healthily) serve as role models for others (22%). Onsite posted nutrition information (28%), an active job (11%), and a supportive manager (6%) were also seen as helpful.

Barriers to Healthy Eating and Physical Activity

Work demands (61%) made it difficult for WCW to take a lunch break or to participate in health education activities. When time was available, WCW reported feeling too tired to participate. They reported selecting unhealthy foods due to convenience and because they are “more comforting than healthy foods.” Having unhealthy food available—from fundraisers, vending machines, families, meetings, and the cafeteria—increased the likelihood of eating it (50%). Lack of onsite fitness facilities (44%), having coworkers who eat/bring unhealthy food (22%), short break time (job characteristics) (11%), and an unsupportive manager (6%) also served as barriers.

Ideas for Employee Wellness Programs

The two most popular wellness topics among WCW were lifestyle management (55%), ie, learning how to integrate healthful changes into busy lives, and attention to ergonomics (55%) to help prevent injuries and make the work day more bearable and comfortable. More agency-sponsored “fun” health activities (eg, marathons, sports teams, health fairs, employee wellness services) were also of interest (44%). WCW indicated that having programs at different times throughout the day, to accommodate the range of schedules and varying work requirements, would make it more convenient to participate (39%). Health education and tools, in the form of tip sheets, quizzes, emails, posted on the company’s intranet, and phone apps would serve as “reminders” to health and would help track goals (33%). Increased fitness opportunities and related programs were also of interest (33%).

Incentive Ideas

Having free items (eg, food, gift certificates) was an incentive for WCW to participate in health programs and practice healthy behaviors (33%). A points-rewards system, where employees who participate in health classes and practice healthy behaviors can accumulate points towards redeeming a prize, was also considered motivating (50%). Having

administrators as role models was inspiring and supportive to WCW (11%). Worksite policy changes, such as flexible working hours to participate in wellness activities, transferring sick leave to paid time off if employees stay sick-free for a specified period, and having the ability to have one's health insurance deductible reduced if they participated in healthy behaviors or remained healthy for a specified period of time were also desired (39%).

Acceptable Evaluation Measures

Visual signs of a more health-oriented worksite (50%), according to WCW, would include health signage and prompts throughout the worksite, happier and more excited employees, increased employee participation in health programs, more healthy food options and fitness supports (bike racks), and healthier administrators. Objective (clinical) assessments (39%), such as body weight and fat, clinical laboratory measures (eg, blood cholesterol, sugar, etc), and blood pressure, tracking of human resource data (eg, workplace injuries, sick days) (28%), and collecting subjective data (eg, focus groups, surveys) on self-reported behaviors (22%) would all be acceptable.

BCW Small Group Survey (Table 3, n=39)

Supports to Healthy Eating and Physical Activity Among BCW
About 50% of BCW respondents indicated that having food from home was supportive of healthy eating, followed by having nutrition information posted in the cafeteria (28%). BCW indicated that their jobs, most of which were physically active, were supportive of physical activity (44%). During break times, BCW preferred to engage in social interaction and rest from physical labor.

Barriers to Healthy Eating and Physical Activity Among BCW
Barriers to healthy behaviors at work, among BCW, were related to work policies and workplace injuries. Not having enough break time (47%) was the most common barrier to healthy eating, followed by job stress (31%). Personal illness or injury (33%) was the most common barrier to physical activity.

Ideas for Wellness Programming and Incentives Among BCW
BCW were most interested in learning about chronic diseases and their risks (eg, heart disease, cancer, diabetes, high blood pressure, 85%) and related topics (fat, cholesterol, portion sizes, 67%). Other programs of interest included exercise and stretching (67%) and recreational classes (dance and massage) (62%). Free fitness clothing and equipment (44%), gym memberships (39%), and food (33%) were identified as being the top motivators for practicing healthful behaviors.

Suggested Evaluation Measures Among BCW

When asked how employers could tell if the worksite was healthier, BCW recommended tracking clinical laboratory values and blood pressure (77%), increases in the number and types of health classes offered by the worksite (42%), and amount and type of healthy food choices available onsite (36%).

Discussion

Results from this study yielded four key implications for those seeking to improve employee's health through worksite health promotion programs. First, findings suggest that there are differences in influences on healthy eating and physical activity among BCW and WCW, suggesting that a "one-size-fits-all" approach when planning a worksite wellness programs is not going to meet the needs of all employees. One of the BCW managers provided an anecdotal observation, stating that BCW men and women bring home lunch almost daily and eat separately; men eat in the break rooms and women in the cafeteria. The BCW manager also stated that due to the BCW work schedules, educational classes are provided during their morning meetings. Having increased availability of healthy food and health classes onsite may be more helpful to WCW than BCW, since BCW do not buy their food onsite and they have a less flexible schedule. Providing education on what constitutes a healthy diet at locations where BCW congregate during breaks or at their regularly scheduled staff meetings may prove more beneficial to BCW. Underlying reasons for differences may include ethnic or cultural and educational differences between the groups, as well as differences in job-related activities.

Second, demographic and health differences between occupational types were observed and must be taken into consideration to ensure that worksite wellness efforts, such as fitness activities and health education topics, are considerate of age and ethnicity.²⁹⁻³¹ Health education materials provided and health information presented should also be appropriate for reading and health literacy levels of participants.^{32,33}

Third, venues to learn about health and worksite wellness offerings tend to differ between BCW and WCW employees. Spending time and money to deliver health information online may increase knowledge only among WCW, since BCW do not have the same online access. Establishing worksite policies related to flex-scheduling may also only serve to benefit WCW. Incorporating alternative working schedules that allow staggered shifts or a schedule that assigns employees to cover for other employees who take breaks for wellness activities may be more accommodating to BCW. Providing health information in agency newsletters and with paystubs will ensure equal accessibility of this information to all employees.

Lastly, gaining the support of both BCW and WCW managers/administrators is important in encouraging employee participation in worksite wellness activities. For BCW, this may be the sole means of BCW accessing worksite wellness offerings. Having administrators who model healthy behavior was motivating to WCW.

Limitations

The chief limitation of this study is the difference in data collection methods used with two different types of workers. While themes from WCW were based on insightful discussion and could be clarified by the researcher as needed, BCW responded only to a survey (albeit one that allowed write-in responses) designed from WCW data and had no opportunity

Table 3. Number and Percent of BCW Survey Participants that Indicated Factors Influencing Healthy Behaviors at Work ^a		
	n	%
Supports to healthy eating		
Having food from home	18	50
Nutrition info posted in cafeteria	10	28
Nice place to eat lunch	7	19
Eating with coworkers	7	19
Healthy options at work	7	19
Coworkers who eat healthy	5	14
Foods coworkers bring	2	6
Barriers to healthy eating		
Not enough time to eat	17	47
Job stress	8	22
Unhealthy options at work	6	17
High work load/demand	4	11
Coworkers who eat unhealthy	2	6
Foods coworkers bring	2	6
Supports to physical activity		
Job characteristics (active job)	16	44
Coworkers who are active	7	19
Barriers to physical activity		
Personal illness/injury	12	33
Coworkers who are not active	7	19
Ideas for programming		
<i>Educational topics</i>		
Fat/cholesterol	19	53
Weight management	16	44
Stress	13	36
High blood pressure	12	33
Heart disease	8	22
Serving sizes/portions	7	19
Cancer	7	19
Diabetes	6	17

for discussion or clarification. Some key ideas of BCW may have been missed. Future studies striving to compare influences affecting healthy eating and physical activity between WCW and BCW should seek to utilize data collection methods that are more comparable.

Other limitations include: group bias and possible error in interpreting thoughts and ideas shared during the focus groups; survey bias, as response options were based on WCW responses and dependent on written (rather than oral) responses; possible response error, as all data were self-reported; researcher bias, as only one researcher collected and analyzed the data; and ethnic and educational differences between BCW and WCW, which may confound differences identified between these occupational

<i>Other programs</i>		
Exercise classes	23	64
Dance classes	13	36
Massage	11	31
Cooking classes	9	25
Workplace safety training	9	25
Fitness/weight loss contest	6	17
Stretching classes	3	8
Incentives		
Free fitness equipment	16	44
Free gym membership	14	39
Free food	11	31
Work-sponsored lunches	2	6
Suggested evaluation measures		
<i>Employee measures</i>		
Lab values (blood cholesterol, etc.)	15	42
Blood pressure	15	42
Sick days used	3	8
<i>Worksite measures</i>		
More health & fitness classes	15	42
Increased healthy food options	13	36
Employee attitudes	9	25
Less workplace injuries	9	25
Coworkers bringing healthy food	6	17

^aBCW responses based on 1 small group survey done among 39 participants.

groups. Findings may represent a select segment of WCW and BCW, due to the low response rate among them (<1% and 17%, respectively), which may possibly be attributed to feelings that their involvement in the study may take a substantial part of time in their already busy schedules or that the study purpose is of low personal salience.³⁴ However, as research has shown low participation rates are not necessarily indicative of substantial bias in a study, concerns about non-participation bias may be of minimal concern. As this study was conducted among workers from a single health care organization in Hawai'i, influences of health behaviors among BCW and WCW in this study cannot be generalized to workers in other settings.

Conclusion

This is the first study to investigate differences in influences to healthy eating and physical activity among understudied ethnic BCW and WCW in Hawai'i and one of few studies investigating the topic within the field of worksite health research. The differences in perspective of BCW and WCW should be considered when developing and planning worksite health promotion efforts, so as to develop a program applicable and appropriate for the workers involved.

Conflict of Interest

The authors report no conflict of interest.

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Emergence of *Burkholderia cepacia* in Honolulu: A Case of Nursing Home-acquired *B. cepacia* sepsis

Charles N.C. Hua MS, MSIII and Jinichi Tokeshi MD

Abstract

Burkholderia cepacia has rarely been reported in Honolulu. Its emergence as a nursing home-acquired pathogen with high mortality rate is concerning. This case report describes a local nursing home patient who was diagnosed with *B. cepacia* sepsis in 2012.

Keywords

Pseudomonas, *Burkholderia*, *cepacia*, nursing home, local, infection, sepsis, elderly

Introduction

Burkholderia cepacia, formerly called *Pseudomonas cepacia*, is a gram-negative rod originally described in 1949 by an American plant pathologist named Walter H. Burkholder, Ph.D. of Cornell University, for causing a distinct stench in decaying onion bulbs called 'sour skin' disease because of its vinegar-like odor (*cepacia* is Latin for "onion-like").¹ *B. cepacia* is often referred to *B. cepacia* complex as a result of many unsuccessful attempts at finding an adequate technique to identify *B. cepacia*.² This was later found to be due to its unusually large genome resulting in marked heterogeneity among several strains identified as "*B. cepacia*" in the early 1990s.² There are currently 17 validly named species under *B. cepacia* complex.²

B. cepacia has emerged as an important opportunistic human respiratory pathogen in patients with cystic fibrosis resulting in abscesses and bacteremia, called "cepacia syndrome."³⁻⁵ Community- and hospital-acquired bacteremia is uncommon in patients without cystic fibrosis, but may potentially result in sepsis, which has significant clinical importance due to its multidrug resistance, resistance to disinfectants and antiseptics, and high mortality.^{6,7} In this report, we discuss and describe a case of nursing home-acquired *B. cepacia* sepsis occurring in Honolulu in 2012.

Case Report

This is an 89-year-old Japanese man, who is a long term resident of a local nursing home, with an extensive medical history of obstructive benign prostatic hyperplasia with indwelling Foley catheter, type 2 diabetes mellitus (T2DM), coronary artery disease, methicillin resistant *Staphylococcus aureus* sepsis, aspiration pneumonia, dysphagia, and status post percutaneous endoscopic gastrostomy, who was stable until 8 days prior to admission when he developed hyperglycemia (serum glucose, 500 mg/dL) and a fever (37.9 °C). His glucose was controlled and stabilized at 300 mg/dL by increasing his glargine and regular insulin, and a urinalysis with reflex culture was ordered. On the morning of admission, he was obtunded with altered mental status and his serum glucose was immeasurable. His urine culture was positive for *Burkholderia cepacia* and he was treated

with ciprofloxacin at the nursing home. However, his symptoms quickly progressed and he was finally brought to the emergency department at a nearby medical center for further evaluation.

On physical exam, the patient was hypotensive (blood pressure, 80/55 mmHg), tachycardic (heart rate, 120 beats per minute), tachypneic (respiratory rate, 33 breaths per minute), and febrile (37.9°C) with coarse crackles bilaterally. Labs revealed hyperglycemia (serum glucose, 424 mg/dL) and leukocytosis (WBC, 13.4 x 10⁹/L) with bandemia. His blood pressure dropped further and he was transferred to the intensive care unit (ICU) for intravenous antibiotics and further management of his deteriorating condition.

At the ICU a central line was placed and he was started on IV vancomycin 700 mg every 8 hours and IV meropenem 2 g every 8 hours. During his hospital stay, his hemoglobin dropped from 14 g/dL to 6 g/dL, and he became profoundly hypotensive. In an effort to stabilize him hemodynamically, he was given a blood transfusion, vasopressin, norepinephrine, epinephrine, and atropine. However, despite pressors and other measures, his condition continued to deteriorate and the patient expired from septic shock two days after admission.

Discussion

B. cepacia is often found as an avirulent bacterium in most healthy people, and is commonly associated with pneumonia in patients with cystic fibrosis. However, *B. cepacia* sepsis in non-cystic fibrosis patients is emerging.^{6,8-10} This is the first published case report of nursing home-acquired, non-cystic fibrosis *B. cepacia* sepsis in the State of Hawai'i.

Since the patient presented with hyperglycemia and altered mental status, inadequate T2DM management was considered during the initial assessment. Infection was also considered because of his advanced age, the acute onset of fever, and severe hyperglycemia with a previous history of well-controlled T2DM. Urinary tract infection is a common cause of delirium in the elderly, and a subsequent urine culture grew *B. cepacia*. *B. cepacia* is found in many sources and has been isolated in humans, soil, plants, and river water, as well as contaminated hospital equipment and disinfectants.^{2,11-13} Common hospital sources of contamination include reagents, indwelling catheters, dialysis machines, and the hands of healthcare workers.¹⁴ The ubiquity and resistance to many antimicrobials makes this microorganism a major potential problem.

The respiratory tract is responsible for the majority of pulmonary infections with *B. cepacia* in cystic fibrosis; however, a recent study showed non-cystic fibrosis bacteremia is most commonly due to infection from central venous catheters, followed by pulmonary infections.^{6,14} Most reports of *B. cepacia*

sepsis revealed the use of a vascular or Foley catheter.¹⁵ In this case, the patient's infection may have originated from several sources, including his urinary tract due to his chronic use of a Foley catheter, his respiratory tract as evident by coarse crackles heard bilaterally, or his gastrointestinal tract secondary to his recent gastrostomy tube placement.

In this case, the initial clinical presentation of the patient along with positive urine culture for *B. cepacia* was consistent with the diagnosis of sepsis. Common identification techniques of *B. cepacia* include commercially prepared *Burkholderia cepacia* selective agar, PCR-recA amplification, and commercial test systems such as API 20NE, Phoenix, MicroScan, VITEK and VITEK 2 (bioMérieux®).^{16,17} Often after identification, management of *B. cepacia* sepsis is difficult and according to a study by Ku, et al, ICU stays occurs in 44% of *B. cepacia* bacteremia.⁶ Similarly, our patient was transferred to the ICU for more appropriate management of his acute sepsis.

The 2012 *Sanford Guide* recommends sulfamethoxazole-trimethoprim, meropenem, or ciprofloxacin as the treatment of choice for *B. cepacia* infections.¹⁸ This patient was initially treated with ciprofloxacin, however, his further decompensation required the need for IV meropenem. *In vitro* studies show that breakpoint concentrations (Minimum Inhibitory Concentration) of meropenem have bacteriostatic activity.¹⁹ Bacteriostatic therapy was decided upon in order to avoid the unwanted effect of temporary increase in inflammation associated with bactericidal drugs.²⁰

Studies show that even with treatment the overall, 28-day mortality rate for *B. cepacia* infections is 41% and overall in-hospital mortality rate is approximately 52%.^{6,21} The two main independent risk factors associated with increased mortality in patients with *B. cepacia* bacteremia include inappropriate initial empirical antimicrobial therapy and elevated Sequential Organ Failure Assessment (SOFA) score, which is a system used to quantify the severity of a patient's illness based on organ dysfunction.^{6,22}

Conclusions

The emergence of nursing home-acquired *B. cepacia* sepsis in non-cystic fibrosis patients presents a serious threat to our community due to its resistance to antibiotics, antiseptics, and disinfectants. Multiple medical problems present in the patients of advanced age contribute to an increased mortality. Therefore, early diagnosis and aggressive treatment of elderly patients with confirmed *B. cepacia* sepsis is critical to increase the probability of survival.

Conflict of Interest

None of the authors identify a conflict of interest.

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Knowledge and Perceptions About Community-acquired Staphylococcal Infections Among Health Care Workers in Hawai‘i

Brandyn S. Dunn MPH, MSI; Alan D. Tice MD; Eric L. Hurwitz DC, PhD; and Alan R. Katz MD, MPH

Abstract

Since the early 1990s, national rates of methicillin-resistant *Staphylococcus aureus* (MRSA) infections have increased dramatically.^{1,2} Initially identified in health care settings, community-acquired MRSA is now a major public health concern. With Hawai‘i’s expanding *S. aureus* and MRSA epidemic closely approximating the national trend in inpatient and outpatient settings,^{7,8} a high level of knowledge and awareness among health care workers is essential to successfully control this evolving epidemic. Health care and related workers were surveyed to assess their knowledge and perceptions about staphylococcal and MRSA infections. Knowledge was estimated by demonstrated ability to correctly identify risk factors including diabetes and obesity, as well as to demonstrate awareness of a growing staphylococcal and MRSA epidemic.^{9,10} Perceptions were estimated by level of concern of antibiotic resistance as well as of the severity of the staphylococcal and MRSA epidemic. Variations in knowledge and perception concerning basic principles associated with *S. aureus* infections as well as characteristics of the evolving *S. aureus* and MRSA epidemic were observed among various occupations (advance clinical practitioners, nurses, public health professionals, athletic trainers, and non-medical workers) as well as work locations (hospital, community, and non-clinical community). Overall, health care and related workers in community settings demonstrated disparities in knowledge regarding *S. aureus* and MRSA infections. They were also more likely to misperceive this growing threat. These findings provide support for focused educational interventions targeting community health care and related workers to improve awareness of staphylococcal infections in order to successfully address and combat this evolving epidemic.

Keywords

S. aureus, MRSA, skin infection, health care workers, community-acquired

Introduction

Over the past few decades, an epidemic of *Staphylococcus aureus* and methicillin-resistant *Staphylococcus aureus* (MRSA) infections has spread across the United States.^{1,2} The initial focus of public health efforts was on hospital-acquired *S. aureus* (HA-SA) and hospital-acquired MRSA (HA-MRSA) infections; however, in more recent years, community-acquired *S. aureus* (CA-SA) and community-acquired MRSA (CA-MRSA) infections have evolved as a greater threat.³ In a recent study, it was determined that approximately 27% of the general population carry *S. aureus* in their anterior nares. These individuals serve as a reservoir for staphylococci and are at higher risk for subsequent invasive infections.^{4,6} Additionally, since the overall number of people in the community outnumber those hospitalized by 330 to one (approximated by US population and total number of staffed hospital beds nationally; See Appendix for derivation), there has been an increasing concern about community-acquired strains due to the larger reservoir of *S. aureus* in the community as compared to the hospital.³⁻⁶ With a continuously evolving epidemic and little resources in our communities, a high level

of knowledge and awareness among health care workers, both in the hospital and in the community setting, are essential to successfully address this epidemic. Since *S. aureus* infections are ubiquitous, not only are outpatient clinical practitioners and nurses responsible for infection control, but other community health care workers such as public health professionals and athletic trainers are necessary partners in an effort to control this evolving *S. aureus* epidemic.

In this study, we focused on Hawai‘i’s health care community. With Hawai‘i’s expanding *S. aureus* and MRSA epidemic closely approximating the national trend in inpatient and outpatient settings,^{7,8} an investigation of knowledge and perceptions of Hawai‘i’s health care workers regarding *S. aureus* and MRSA infections may help identify knowledge gaps, which could be addressed with targeted educational strategies. The overall objective of this survey was two-fold: (1) to gather information from a range of health care occupations in Hawai‘i in order to understand their knowledge and perceptions of *S. aureus* and MRSA infections, and (2) to use this information to help guide future efforts in infection control and prevention.

Methods

This was a descriptive, cross-sectional study of health care workers in Hawai‘i using an anonymous web-based survey. The target population was selected by contacting several core health-related organizations throughout the state of Hawai‘i in order to obtain a representative sample of individuals of varying levels of clinical education and clinical exposure, including advanced clinical practitioners, nurses, public health professionals, and athletic trainers. Organizations contacted included: Hawai‘i Public Health Association (HPHA), Hawai‘i Nursing Association (HNA), Hawai‘i Primary Care Association (HPCA), Hawai‘i Department of Health Public Health Nursing Branch (DOH – PHN), Hawai‘i Athletic Trainers’ Association (HATA), and University of Hawai‘i Medical Students and Faculty (UHMed). These organizations were selected due to their professional stature in the community and their extensive membership.

Informed Consent

A generic cover letter was sent to all prospective survey participants providing background information on the study and emphasizing anonymity of responses and the voluntary nature of participation. The survey URL address was provided at the end of the cover letter so individuals could access the survey. The cover letter with the survey URL address was sent out to

all members of each organization using the organizations' e-mail list-serve. Each organization sent out one reminder e-mail (December 2010) to their members three weeks after the initial e-blast (November 2010). IRB approval was obtained through the University of Hawai'i Committee on Human Studies (IRB Approval # 18581).

Survey Instrument

A brief web-based survey was designed using the web-based application SurveyMonkey®, which allowed for anonymous data collection. The survey was pilot-tested on a class of approximately 30 nursing students at the University of Hawai'i at Manoa to verify the clarity and acceptability of questions. The entire survey tool investigated health care workers' knowledge and perception of the epidemiology, diagnosis, and treatment of *S. aureus* infections as well as their opinions on how to better prevent *S. aureus* infections in their community (See appendix for survey instrument).

Data Analysis

Survey responses were stratified into five groups depending on their reported occupation (Advanced Clinical Practitioner, Nurse, Public Health Professional, Athletic Trainer, or Non-Medical) and three work location categories taking into account reported occupation as well as work location (Hospital, Clinical Community, or Non-Clinical Community). Physicians (17) and other clinical prescribers (6) were included in the Advanced Clinical Practitioner (ACP) category. Non-Medical individuals included a range of occupations varying from social worker to university professor to administrative staff. ACPs and nurses were divided into Clinical Community (14 ACPs; 52 Nurses) and Hospital (9 ACPs; 30 Nurses) settings based on their self-reported work location. Respondents who identified themselves as Public Health Professionals, Athletic Trainers, and Non-Medical individuals were assigned to the Non-Clinical Community (N-C Comm.) category. Despite major difference in training and experience, the Non-Clinical Community category represented a variety of individuals with generally little to no clinical education and exposure. For questions concerning perceived seriousness of *S. aureus*, MRSA and antibiotic resistance, survey responses were grouped into three categories: "Normal Problem" (including No Problem, Small Problem, and Normal Problem), "Serious Problem" (including Serious Problem and Very Serious Problem), and "Unknown".

Data were parsed using Excel 2007. Frequencies were calculated for all categorical variables.

Results

Characteristics of Study Population

Of approximately 3,420 eligible study participants (HNA - 2,400 members; UHMed - 400 members; HPHA - 300 members; HATA - 170 members; DOH-PHN - 100 members; HPCA - 50 members), a total of 212 individuals participated in the voluntary and anonymous survey (6.2% response rate). The demographics of the study population are presented in Table 1.

Table 1. Demographic Information of Study Population	
Study Population Demographics	
	No. (%) of Respondents
Age	
<20 – 40 yrs	84 (39.6)
41 – 60 yrs	102 (48.1)
>60 yrs	25 (11.8)
Ethnicity	
Asian	66 (31.1)
Caucasian	110 (51.9)
Native Hawaiian/Pacific Islander	22 (10.4)
Other	13 (6.1)
Post High School Education	
1-4 yrs (Associates/Bachelor Degree)	58 (28.2)
5-6 yrs (Masters Degree)	75 (35.4)
>7 yrs (Doctoral/Professional Degree)	73 (34.4)
Student	
Yes	44 (20.8)
No	159 (75.0)
Occupation	
Advanced Clinical Practitioner (ACP)	23 (10.9)
Nurse (N)	82 (38.7)
Public Health Professional (PH-Prof.)	42 (19.8)
Athletic Trainer (ATC)	34 (16.0)
Non-Medical (NM)	25 (11.8)
Work Location	
Hospital (ACPs & Nurses)	39 (18.9)
Clinical Community (ACPs & Nurses)	66 (32.1)
Non-Clinical Community (PH Prof, ATC, NM)	101 (49.0)

Evaluation of Knowledge

Knowledge of staphylococcus infections was based on questions regarding risks of infection associated with diabetes, obesity, seawater, and pets, as well as respondents' ability to correctly recognize the growing staphylococcal and MRSA epidemic.^{9,10} Obesity and diabetes are well-defined risk factors; however, pet and seawater exposure are not considered consensus risk factors.^{4,11-17}

Understanding Risk Factors

Responses were stratified based on work location and occupation to investigate variations in knowledge and understanding. Responses stratified by work location showed no notable differences between Hospital, Community, and Non-Clinical Community workers. In Figure 1, four exposure factors including, seawater, pets, obesity and diabetes, were compared among different occupations. For both obesity and diabetes, ACPs (89.5% and 100%, respectively) and nurses (88.1% and 95.5%, respectively) were more likely to correctly identify an

association with *S. aureus* infections compared to public health professionals, athletic trainers, and non-medical respondents (Obesity: PH-Prof, 58.8%; ATC, 42.4%; NM, 39.1%); (Diabetes: PH-Prof, 76.5%; ATC, 53.1%; NM, 59.1%) (Figure 1). Over 50% of the respondents within each occupation (ACP, 55.0%; N, 67.2%; PH-Prof, 70.59%; ATC, 61.8%; NM, 78.3%) identified an association between seawater and *S. aureus* infections. When asked about the relationship between pets and *S. aureus* infections, just over half of all nurses (55.4%), public health professionals (53.1%), and non-medical workers (52.1%) identified an association; however, a smaller proportion of ACPs (36.8%) and athletic trainers (38.2%) identified the association (Figure 1).

Response to Epidemiologic Trends

When asked about incidence of *S. aureus* and MRSA infections, over two-thirds of Hospital, Community, and Non-Clinical Community workers believed there was an increase in the past 5 years (Table 2). Similarly, regardless of occupation, all respondents thought that *S. aureus* and MRSA infections had increased in the past 5 years (Table 2). Regardless of occupation and work location, all respondents believed *S. aureus* and MRSA infections have increased over the past 5 years.

Evaluation of Perception

The respondents' levels of concern regarding antibiotic resistance as well as their perceptions on the seriousness of the staphylococcal and MRSA epidemic were evaluated.

Understanding Severity of Antibiotic Resistance

Individuals' level of concern on the subject of antibiotic resistance was assessed by respondents' answer to the survey question regarding severity of antibiotic resistance. Responses were stratified based on work location and occupation to investigate variations in perception (Figure 2). When separated by work location, Hospital workers were generally more concerned about antibiotic resistance compared to Community and Non-Clinical Community workers (Serious Problem: Hospital, 59.4%, Community, 42.1%, Non-Clinical Community, 40.2%). Differences in perception were also observed when concern about antibiotic resistance was stratified by occupation. Overall, ACPs and Non-medical workers (70.0% and 52.2%, respectively) were more likely to identify antibiotic resistance as a serious problem compared to Nurses, Public Health Professionals, and Athletic Trainers (42.0%, 40.0% and 32.4%, respectively).

Understanding Seriousness of Infection

When asked about the seriousness of *S. aureus* and MRSA infection, respondents' perceptions differed depending on their work location and occupation. ACPs and Nurses working in the hospital perceived both *S. aureus* and MRSA infections as more of a serious problem compared to community ACPs and Nurses. In addition, Non-Clinical Community workers perceived *S. aureus* and MRSA infections as less of a serious problem compared to both hospital and community ACPs and Nurses. This suggests that an individual's work location influences his or her level of concern regarding *S. aureus* and MRSA infec-

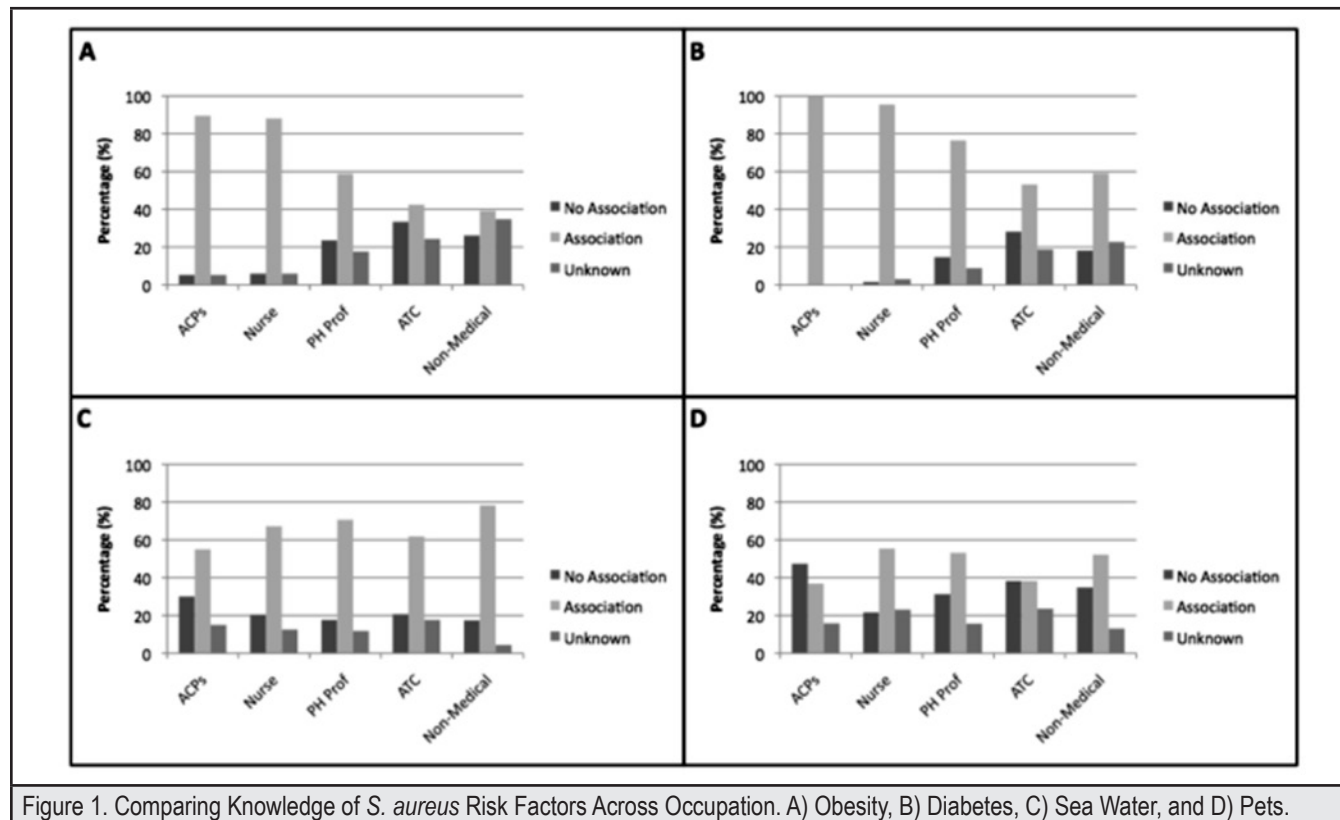


Figure 1. Comparing Knowledge of *S. aureus* Risk Factors Across Occupation. A) Obesity, B) Diabetes, C) Sea Water, and D) Pets.

Table 2. Comparing perceptions regarding the epidemiologic trends in *S. aureus* infections and MRSA infections stratified by occupation and work location.

Category		What do you think has happened in the past 5 years to the following conditions?		
		Decreased n (%)	Unchanged n (%)	Increased n (%)
Work Location				
S. aureus Infections	Hospital*	2 (6.3)	8 (25.0)	22 (68.8)
	Community*	3 (5.4)	13 (23.2)	40 (71.4)
	N-C Comm.**	5 (5.6)	15 (16.7)	70 (77.7)
MRSA Infections	Hospital*	1 (3.1)	2 (6.3)	29 (90.6)
	Community*	2 (3.7)	5 (9.3)	47 (87.0)
	N-C Comm.**	7 (7.8)	11 (12.2)	72 (80.0)
Occupation				
S. aureus Infections	ACP	1 (5.0)	6 (30.0)	13 (65.0)
	Nurse	4 (5.9)	15 (22.1)	49 (72.1)
	PH Prof.	3 (9.1)	4 (12.1)	26 (78.8)
	ATC	1 (2.9)	6 (17.7)	27 (79.4)
	Non-Medical	1 (4.4)	5 (21.7)	17 (73.9)
MRSA Infections	ACP	0 (0)	3 (15.0)	17 (85.0)
	Nurse	3 (4.6)	4 (6.1)	59 (89.4)
	PH Prof.	4 (11.8)	4 (11.8)	26 (76.5)
	ATC	2 (5.9)	2 (5.9)	30 (88.2)
	Non-Medical	1 (4.6)	5 (22.7)	16 (72.7)

*Hospital and Clinical Community only include ACPs and nurses that specified their location of occupation.
 **Non-Clinical Community includes classified PH Professionals, Athletic Trainers, and Non-Medical individuals.

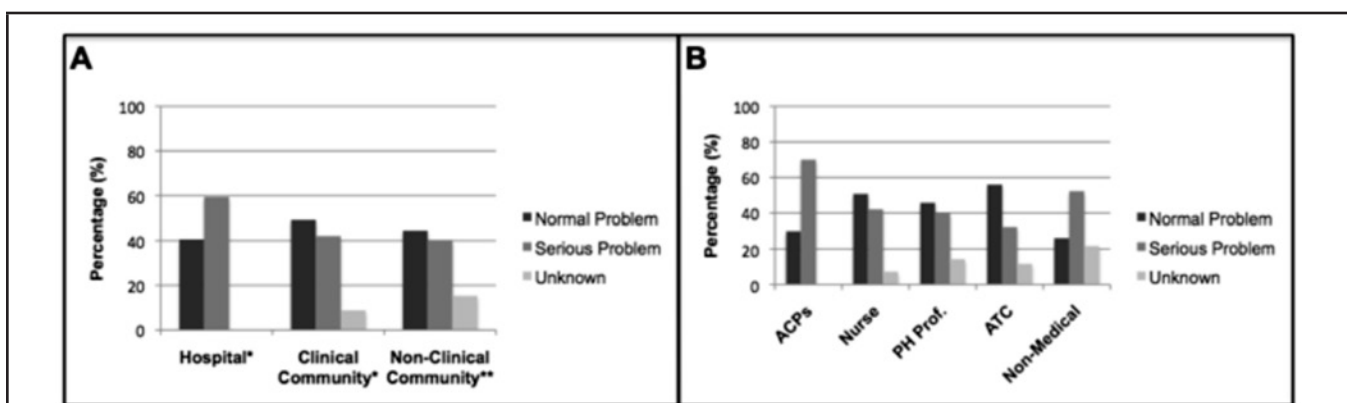


Figure 2. Comparing level of concern regarding seriousness of antibiotic resistance among health care workers by occupation and work location. A) Antibiotic Resistance stratified by work location, B) Antibiotic resistance stratified by occupation.

tions (*S. aureus* Infections: H, 59.4%; C, 50.9%; N-C Comm., 37.0%); (MRSA Infections: H, 62.5%; C, 50.9%; N-C Comm., 42.4%) (Figure 3). Additionally, differences in perception regarding the seriousness of *S. aureus* and MRSA infections were observed when stratified by occupation. (*S. aureus* Infections: ACP, 70.0%; N, 49.3%; PH-Prof, 37.1%; ATC, 41.2%; NM, 30.4%); (MRSA Infections: ACP, 70.0%; N, 50.7%; PH-Prof, 51.4%; ATC, 35.3%; NM, 39.1) (Figure 3).

Discussion

With a rise in *S. aureus* and MRSA infections outside of the hospital, community health care workers are essential partners in the effort to successfully address this growing epidemic.¹⁻³ This study identified disparities in knowledge and perceptions among Hawai'i's health care and related workers regarding basic principles associated with *S. aureus* infections as well as characteristics of the *S. aureus* and MRSA epidemic.

As our understanding of *S. aureus* transmission continues to evolve, it is important that all health care workers be familiar

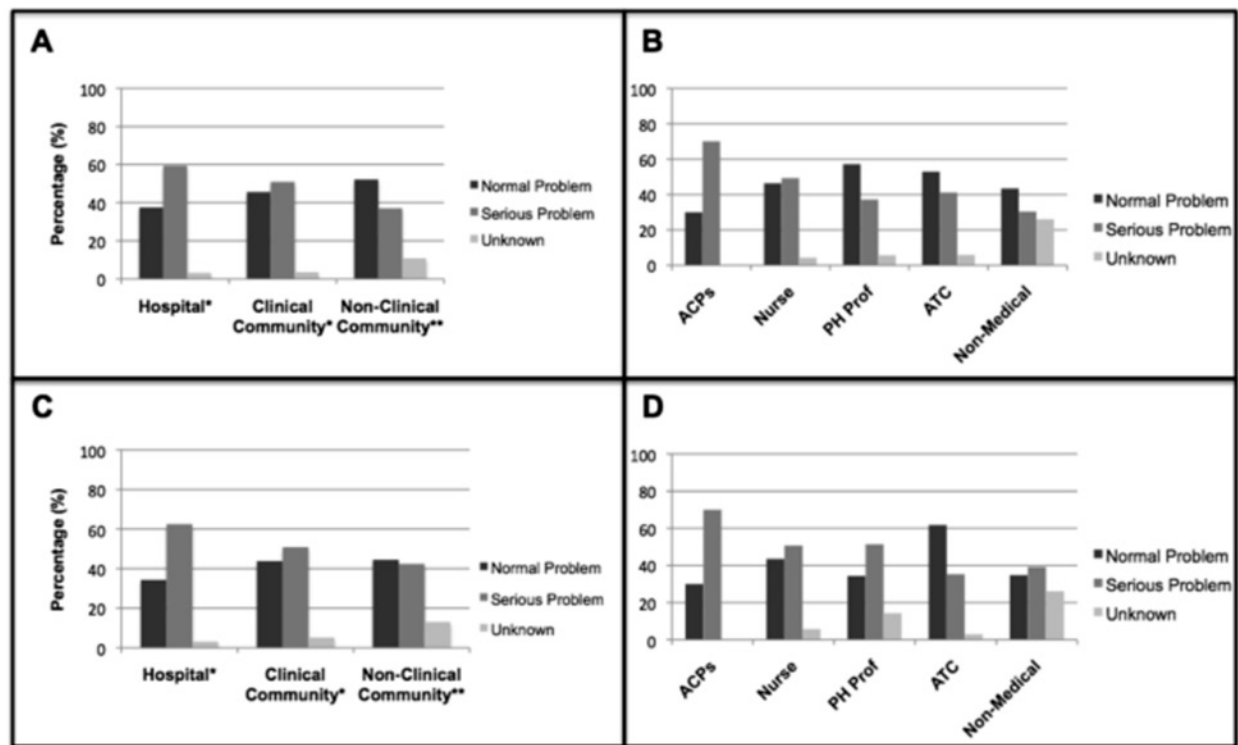


Figure 3. Comparing perceptions of health care workers regarding the severity of *S. aureus* and MRSA infections stratified by occupation and work location. A) *S. aureus* infections stratified by work location, B) *S. aureus* infections stratified by occupation, C) MRSA infections stratified by work location, and D) MRSA infections stratified by occupation.

*Hospital and Clinical Community only include ACPs and nurses that specified their location of occupation.

**Non-Clinical Community includes classified PH Professionals, Athletic Trainers, and Non-Medical Individuals.

with risk factors that increase an individual's susceptibility to *S. aureus* infections. Due to the complex relationship between *S. aureus*, humans, and the environment, health care workers were asked to identify various risk factors associated with staphylococcal infections to determine their level of knowledge.⁴ The majority of ACPs and nurses correctly recognized obesity and diabetes, two well-documented risk factors, as being associated with *S. aureus* infections.^{4,11-13} Conversely, public health professionals, athletic trainers, and non-medical workers were less likely to identify obesity and diabetes as risk factors associated with *S. aureus* infections. When asked about seawater and pets, the majority of respondents believed there was an association despite inconclusive evidence in the literature of an association between *S. aureus* and seawater and pets.¹⁴⁻¹⁷ These findings are concerning, not only because the majority of the surveyed health care workers believe in uncertain risk factors, but also that some health care workers are not aware of the well-documented associations between staphylococcus infections and obesity and diabetes.^{4,11-13} From these findings, it is apparent that more education is necessary to ensure that the entire health care community, including allied health professionals, is aware of *S. aureus* risk factors.

With a continuously evolving epidemic, staphylococcus and MRSA infections both in and out of the hospital are growing in number and severity.^{1,2,7,18} In Hawai'i, isolated sub-populations

have documented increases in MRSA incidence suggesting an overall increase in MRSA locally.^{9,10} A reassuring finding was that the majority of respondents, irrespective of work location or occupation, recognized that the incidence of *S. aureus* and MRSA has increased in the previous 5 years. However, when asked about the seriousness of the epidemic, respondents' perceptions differed depending on their work location and occupation. This discrepancy may be explained by the variety of cases health care and related workers are exposed to in the hospital as compared to the community. Perhaps health care professionals in the community may not handle severe *S. aureus* and MRSA infections despite a well-documented growing prevalence of CA-SA and CA-MRSA.¹⁻³

The World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) have identified antibiotic resistance as a global problem and an imminent threat. With antibiotic resistance a focal point of most global health-related organizations dealing with infectious diseases, this study investigated the respondents' overall perception regarding the seriousness of antibiotic resistance.¹⁹⁻²¹ Individuals classified as Community or Non-Clinical Community workers were less inclined to identify antibiotic resistance as a serious problem. This information is worrisome due to the larger number of vulnerable *S. aureus* and MRSA carriers present in the community as compared to the hospital.^{5,6} Additionally, differences

in perception regarding antibiotic resistance were also noted when responses were stratified by occupation. Less than half the nurses, public health professionals, and athletic trainers considered antibiotic resistance a serious problem. This suggests that more education aimed at health care workers in and out of the hospital is vital to raise awareness about the current threat of antibiotic resistance.

This study was subject to several limitations. A small sample size precludes precise estimates of associations. The study had a very low response rate, a likely source of selection bias, which may result in problems with internal as well as external validity. Overall, the small sample size and the low response rate reduce the ability to generalize key findings regarding knowledge and perception to Hawai'i's entire health care population. Nevertheless, despite these limitations and due to the voluntary nature of our sampling technique, individuals that were more likely to respond were probably more interested in *S. aureus* infections.²² As a result, this would suggest that health care professionals—even with interest in *S. aureus* infections—may not be well aware of the nature of the epidemic and the problem at hand. Additionally, since the study population included only health care related workers, the sample lacks generalizability to the general population and their perceptions. Similarly, the use of only one major organization within each profession as well as using a listserv as the mechanism to contact members potentially limits the generalizability of the study results. In addition, a potential bias may have been introduced when asking about individuals' perceptions within their community due to the lack of specification of whether this related to their work or home community; however, the probability that respondents were confused is unlikely since this issue was not identified in the pilot survey. Finally, the Non-Clinical Community category contains several different health-related and non-health-related occupations; consequently, this potentially introduces additional confounding within this category.

Conclusion

Variations in knowledge and perceptions regarding basic principles associated with *S. aureus* infections as well as characteristics of the *S. aureus* and MRSA epidemic were observed among different occupations as well as work locations. In designing this study, discrepancies in knowledge were anticipated due to varying levels of clinical education and exposure. Nevertheless, the basic points considered in this study are important for health care workers to be aware of to appropriately address this evolving epidemic. Consequently, these findings provide specific areas of focus for targeted educational outreach. Overall, health care and related workers within the community setting demonstrated disparities in knowledge regarding *S. aureus* and MRSA infections and were more likely to misperceive this growing threat. These findings support the need for focused educational interventions targeting community health care and related workers to improve awareness of staphylococcal infections in order to successfully address and combat this emerging epidemic.

Conflict of Interest

None of the authors identify any conflict of interest.

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Appendix

Approximate Number of People in Community Compared to Patients in Hospital (National)

US Population: 311,591,917 (July 2011)

Staffed Beds in All US Registered Hospitals (AHA Statistic):

941,995 (Jan. 2012)

$$\frac{941,995}{311,591,917} = (0.003023169)^{-1} = 330:1$$

Explanation: Approximately 330 individuals in community for every one hospitalized patient

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Domestic Violence Against Women on Yap, Federated States of Micronesia

Geraldine Luchuen Dugwen BS; W. Thane Hancock MD, MPH; James Gilmar AS; John Gilmatam BA; Petra Tun MO; and Gregory G. Maskarinec PhD

Abstract

Anecdotally there are high rates of domestic violence in the small Micronesian State of Yap, Federated States of Micronesia (FSM), but there have been no studies to quantify the prevalence or characteristics of domestic violence in Yap or in any other state of the FSM. A survey was administered to women at the Yap hospital and community health centers from February through June 2011. Survey data were on domestic violence, which was supplemented by a focus group to explore the issues involved in greater detail. A high prevalence of domestic violence was documented by the survey; perceptions about this were explored in the focus group. On the questionnaire, 148 of 194 (76%) women reported at least one form of abuse. Given the small number of adult women in Yap, these findings suggest that domestic violence is a serious, pervasive problem that Yap needs urgently to address. The issue clearly needs to be investigated throughout the other states of the FSM and addressed at the national policy level as well as at the state level.

Background

Yap, the western-most state of the Federated States of Micronesia (FSM) is located in the western Caroline Islands midway between Guam and Palau. Yap has a total population of approximately 11,200.¹ A majority, 65%, of the population resides on Wa'ab (Yap Proper); four islands connected by roads, waterways and channels, which includes the town of Colonia, Yap's capital, whose population is about 1000. The population density is 243 per square mile (190 for Wa'ab and 550 for the Outer Islands, comparable to the state of Hawai'i's population density of 216.8 inhabitants per square mile²) and the median age is 20.9.³ According to the 2000 census (still the most recent data available in 2013, with preliminary data from the 2010 census suggesting little change⁴), there were a total of 2,030 households in Yap, with a median of 5.4 persons per household. Some cash income was reported by 1,578 households (77.7%), with a mean household income of \$8,300. Yap's literacy rate is 92%. Life expectancy at birth is 66.5 for males, 67.6 for females. In 2004, per capita expenditure on health was US\$180, an increase from US\$116 in 2002.⁵ By 2008 this had increased to US\$470 per capita⁶ (the World Bank reports the annual per capita health expenditure for the United States, 2008-2012, as \$8,362; and for Yap's nearest neighbor, Palau, as \$930).⁷

Domestic violence is defined as violence against women, men or children by someone in their family.⁸ It is also known as domestic abuse, spousal abuse or intimate partner violence (IPV). For adults, IPV has been defined as control by one or both partners in an intimate relationship such as marriage, dating, or cohabitation. Domestic violence has many forms, including physical aggression (hitting, kicking, biting), verbal/emotional abuse (yelling, threats, blame), sexual abuse, and economic coercion.

It has been difficult to determine precisely the prevalence of

domestic violence in Yap since (1) most abuse goes unreported; (2) there is no organization on Yap that keeps records on the number of reports or calls; and (3) data cannot be found in hospital or clinic records. Stories told by health care professionals in Yap suggest anecdotally there are high rates of domestic violence yet there have been no surveys to quantify the prevalence and characteristics of domestic violence in Yap, or anywhere else in the FSM. An Outer Island Health Assessment concluded: "Domestic violence is not often publicly discussed among the Micronesian community."⁹

Domestic violence occurs throughout the world's cultures and Yap is unfortunately no exception. Many men as well as women have experienced at least one type of abuse, however, this paper focuses on women, who are typically more often victimized, while men are more often the perpetrator.¹⁰ Regular substance use has been shown to be a contributing factor to domestic violence.¹¹ Quingley and Leonard (1999) state that "across a number of recent studies, the drinking pattern of the husband has emerged as one of the most consistent correlates of marital violence,"¹² a pattern found to be true of Micronesians,^{13,14} although a recent study suggests that, at least among teenagers in Hawai'i, drug use may be more closely associated to IPV than alcohol.¹⁵ Additionally, "IPV by both genders is associated with negative consequences that result in injuries, fear, depression, post-traumatic stress disorder, suicide, and homicide, although male-perpetrated IPV has more detrimental effects."¹⁶ Increased health problems, including injury, chronic pain, gastrointestinal health problems, sexually-transmitted diseases, depression, and post-traumatic stress disorder are well documented by research on abused women in various settings.^{17,18}

This study focuses on the extent to which domestic violence exists on Yap, compares past and current IPV and child abuse in the family, and examines whether substance use was present at the time of the abuse.

Methods

This study used a mixed methods design. Quantitative data was collected via a written survey, while qualitative data was collected via a focus group. The study protocol was approved by the directors of the hospital and the community health centers acting as Yap's Institutional Review Board.

1. Survey

Data Collection Procedures:

No previous surveys have been conducted in Micronesia, so no culturally appropriate validated survey instrument exists. A survey was developed on domestic violence with input from

members of the Yap Department of Health Services Division of Public Health and the Wa'ab Community Health Center (WCHC). It was piloted and revised twice before being implemented. The survey on domestic violence was conducted on Yap from February 2011 through June 2011. All women of Yap were invited to participate by completing the survey at one of the four WCHC sites or the Yap Hospital Outpatient Department. The anonymous written survey was offered to all women, aged 18 years and over. Some health care providers also offered the survey in several villages throughout Wa'ab.

Most women completed the survey without assistance from anyone. For women who requested translation services, health professionals from the WCHC or Yap Department of Health Services assisted in completing the survey. The survey, reproduced in Appendix 1 (see Appendix 1: <[http://hjmp.org/HJMPH_Sep13\(Dugwen_Appendix\).pdf](http://hjmp.org/HJMPH_Sep13(Dugwen_Appendix).pdf)>), was offered to women residing in Yap regardless of whether or not they were originally from Yap.

Survey Analysis

An Access database was created to enter survey responses, which were then exported to Excel for tabulation and analysis by the authors. Data was used from all 199 completed surveys, and since there are less than 2000 adult women on Wa'ab (the total number of all-age females in 2000 was 3695 with 50% of the total under the age of 18), the survey represents approximately a 10% sampling of Yap's adult female population. For partially completed surveys, the denominator was adjusted for categories that were unanswered. Surveys had no personal identification on them, so it is impossible to determine whether women took the survey more than once; however, women were instructed to submit only one survey, and results were examined to be certain no exactly duplicate responses were submitted.

2. Focus Group

Data Collection Procedures

A single focus group was conducted to discuss the issues involved in IPV in greater detail. Eight Yapese women volunteered to participate in the four-hour session. All women were from two villages in the same municipality. The focus group was held in a community house in one of their villages. No incentives were offered. The discussion was conducted in Yapese, facilitated by this paper's first author who is fluent in Yapese. The following six questions were asked in the focus group:

- (1) Is domestic violence part of our culture?
- (2) What do you think causes a husband or partner to become violent?
- (3) Why do women still stay in the marriage?
- (4) Do you think the violence that children witness affects them and in what ways?
- (5) Why do women not talk to someone in the community or family member about it?
- (6) How and/or what can we do to address domestic violence particularly in Yap?

Women were not selected because they were abused, only because they volunteered to participate.

Focus Group Analysis

The focus group was recorded and transcribed into English. Data were analyzed using classic triangulation analysis,¹⁹ with key passages selected by the authors.

Results

1. Survey Results

A total of 199 women participated in the anonymous survey, with 76% (n=148) of respondents reporting experiencing at least one type of abuse; 93% of those reported having experienced verbal abuse, 41% physical abuse, 9% reported sexual abuse with an intimate partner (demographics are reported in Table 1, and key findings are summarized in Table 2).

Table 1. Demographics of the survey participants.		
Income n=177		
\$1,000 or Less	86	49%
\$1,000 - \$3,999	32	18%
\$4,000 - \$6,999	31	18%
\$7,000 - \$10,999	13	7%
\$11,000 and more	15	8%
Education Level n= 197		
College	75	38%
Elementary	34	17%
High School	88	45%
Current Relationship Type n=172		
Married in court	9	5%
Married in church	26	15%
Cultural marriage	107	62%
Live-in	20	12%
Live apart	10	6%
In a Current Relationship n=194		
Yes	160	82%
No	34	18%
Have Children n=157		
Yes	119	76%
No	38	24%
Median Age	37	
Range	18-70	

Additionally, 62% of women who reported abuse indicated that their male partner was usually under the influence of alcohol during the abuse. Of the women who reported abuse, 38% reported having been abused as a child; 19% reported having been sexually abused, 24% reported having been physically abused, 53% reported having been verbally/emotionally abused and 45% of the total respondents reported that the perpetrator, a family member, was under the influence of alcohol at the time of abuse.

Table 2. Key Results of the Domestic Violence Survey (different denominators indicate number of women who answered that question)		
Description	Count	Percent
Self-reported abuse history		
Never been abused	38/194	20%
Experienced at least one type of abuse	148/194	76%
Current and past abuse by family	8/194	4%
Women who ever experienced physical or sexual abuse	88/194	45%
Women who are currently in a relationship that is abusive	97/160	61%
Women who are currently in a verbally abusive relationship	90/97	93%
Women who are currently in a physically abusive relationship	40/97	41%
Women who report ever being abused by a male family member as a child	58/153	38%
Women who would see a professional domestic violence counselor if available on Yap	130/187	70%
Women who would use a women's shelter	103/186	55%

Respondents also indicated how they wanted the problem of domestic violence addressed on Yap. The majority responded that they would see a health professional trained in mental health counseling (70%) and that a shelter for battered women should be built on Yap (55%).

2. Focus Group Results

Four main themes emerged from the focus groups: (1) personal experiences of abuse; (2) reasons for silence on the topic; (3) cultural influences; and (4) suggestions for improving the situation.

All eight focus group participants reported having experienced at least one type of abuse or to know another female victim. They agreed that the consumption of alcoholic beverages and use of marijuana contribute greatly to domestic violence on Yap. When asked if they had thought of going to the police or running to someone for safety, participant responses included one woman who said “it’s hard to think of anything at the time of the actual beating.” Another woman said “most of the time we don’t see it coming and so we are not prepared and it’s hard for us to run off when the kids are scared and crying.” Only a few women admitted being able to escape the violence by running into the bushes and waiting until their husband was asleep before going back to the house, or finding safety in a neighbor’s house. “As for the police, it’s hard because they either get to the scene and it’s finished or when they arrive they are told to go back and mind their business,” one woman added. These women felt that when they were growing up, intimate partner violence was less frequent and less common in their parents’ generation.

During the focus group, one woman related a personal experience: “an unfaithful male who is cheating on his partner, would accuse her of cheating on him,” an observation to which the rest of the participants agreed. There are women who reported being physically abused if a man other than their intimate male partner talked to her - at work, shopping or at a social gathering. “It’s an excuse to beat us up and no matter what we say or

the fact that we’re innocent, he’s always right.” Many of the beatings are severe, leaving the female partner on the ground crying, pleading, and covered in blood.

As for records at the hospital, focus group participants did not believe that there was much IPV data for Yap because, when they do seek medical care, the description of the incident is changed before the woman reaches the hospital. Victims claim they fell or weren’t looking where they were going and walked right into a door or corner of a shelf. Instead of seeking medical care, most women either stay home or go to their family for local medicine to treat the cuts, bruises and broken bones. These women are constantly living in fear and are reminded that if they leave they will never see their children or meet someone else. Though much of the abuse seems barbaric, most of the women on Yap choose to stay in their marriage.

“I only go back to my husband after each fight not because I still love him, but because of the children. Earlier on in the marriage, after the first physical and verbal/emotional abuses, I left and went to my family for security. He came the next day sober and said he will never drink again, yell at us and tell us to leave. It’s been more than five years and it’s still happening, but I’m only staying for the children.”

One woman commented that in Yapese culture, if the woman dies while married to her husband, their children will have land, which provides them with security and stability. Perhaps, she added, “this is why some brutally abused women stay with the same partner until death from the abuse. But abuse of any type is not a part of the traditional culture of Yap. There was no tradition of using violence to ‘discipline’ your wife.” Traditionally, at the beginning of the marriage, the wife’s family would inform the husband’s family that if she misbehaves, to “put her on the road” so she can go back home, but never to beat her up, but this custom is no longer practiced.

When two or more women gather, participants related, they often gossip about a guy in the community who beat up his wife because of the visible bruises on her face and arms, but when she is confronted she lies and comes up with excuses.

When asked why some women don't go and ask someone in the community for assistance, the respondents felt that this would be perceived as gossiping about your family and allowing the community to know what one's husband does. Since Yap is small in size and population, women fear that once the word reaches their partner, the next beating will be worse than the last and will come at a time when they least expect it.

Focus group participants also noted that they are not the only victims of abuse. One of the women said her husband verbally and physically abused their children to make her feel bad. "The abuse happens at home and parties or family gatherings. Every time I tell him not to yell or talk harshly at our kids especially in a crowd, I always get beaten up at home and yelled at that I'm an animal and do nothing for him or his family."

Some women report feeling ashamed if the community finds out. Some feel they deserved the abuse, and there are women who feel it is a private family matter that should not involve the government, community members, or friends.

Discussion

Both our survey and focus group demonstrate that domestic abuse is definitely a problem in Yap.

The results of this study suggest that Yap may fit into the mid-range of domestic abuse rates throughout the world. A WHO multi-country study found a range between 15% (Japan) to 71% (Ethiopia) of women aged 15-49 years reported physical and/or sexual violence by an intimate partner at some point in their lives.²⁰ High rates of women being victims of physical abuse have been shown for Barbados at 30%, Canada at 29%, Egypt at 34%, New Zealand at 35%, Switzerland at 21%, and United States at 25%. This study shows that Yap at 41% has a higher percentage than any of these.²¹ The problem may well be as severe throughout the FSM, where at least two deaths have been reported as the result of severe wife beating,²² but a culture of silence still surrounds the issue throughout Micronesia.⁸ Nearby, the Republic of Palau faces similar problems of domestic violence, as reported by a 1997 survey,²³ while Samoa has also reported significant cases of domestic violence.²⁴

Domestic violence is not healthy in any relationship, regardless of culture or traditions. Substance use and abuse contributes to the problem; our findings regarding the effects of alcohol support the findings of a study on injuries in Yap that showed that 88% of all injuries were alcohol related.²⁵ Furthermore, hundreds of studies have shown that alcohol abuse is closely associated with violence and offenses,²⁶ but this should not be considered an excuse for domestic violence. Yap's women are especially vulnerable, as this study indicates that they face high rates of domestic violence but lack options for escape, protection or support.

The FSM laws may not have a clear legal position aimed specifically at domestic violence, but domestic violence falls under the definition and description of assault under Yap State Law No. 2-48 Section 209 and severe cases need to be prosecuted

under this law. The FSM did accede without reservations to the UN treaty that included the Convention on the Elimination of All Forms of Discrimination against Women in September of 2004,²⁷ though it remains unclear whether the FSM regards itself as bound by the provisions of that treaty.

The prevalence of domestic violence throughout the FSM, including the Outer Islands of Yap, should be documented by surveys similar to this one, to inform a national level policy discussion on how to remedy the problem in ways that are culturally sensitive yet effective.

These findings are subject to several limitations. As the study was conducted in the health centers and hospital, the study sample may not be perfectly representative of all Yapese women. However, because health care services are essentially free in Yap and the health centers are distributed around Wa'ab, the survey is likely to be representative of the women of Wa'ab. Clearly the sample is not representative of the women residing in the outer islands. Some responses to the survey were invalid/never completed. Only 7 Outer Island women completed the survey, and therefore the results may not be applicable to Yap's Outer Islands. For a more representative sample, women from the Outer Islands need to be included in future research. The sample suffers from being a convenience sample and therefore is open to bias, since data were gathered from a convenience sample. Women who were either abused themselves or knew of someone who may have been more interested in participating, which would result in the over-representation of the prevalence of IPV. However, it may also be argued that women who experienced abuse may be more uncomfortable with participating in a domestic violence survey or focus group, which in turn would result in the under-reporting of IPV.

Conclusions

In 2009, President Mori of the FSM signed a proclamation that on November 25, 2009, the FSM would observe International Domestic Violence Prevention Day. The proclamation urged all residents of the FSM to raise social awareness on the issue of domestic violence against women and its prevention.²⁸ However, as of the writing of this paper in 2012, there has not been another observance on this issue. It would be beneficial if individuals and agencies in the community that have experience, training, and education on violence and substance abuse advocate for the victims and raise community awareness that this problem requires action. These individuals and/or agencies include law enforcers, medical, and legal professionals who come in contact with victims of violence, abuse, or substance abuse. Together these agencies, along with the hospital and community health centers, should participate in discussions on ways that social policies can be improved to address this problem, a discussion this study hopefully facilitates.

Conflict of Interest

None of the authors identify any conflict of interest.

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MEDICAL SCHOOL HOTLINE

White Coat Ceremony Keynote Address: “Your A-Ha Moment”; July 19, 2013

Melanie R. Arakaki MD

The Medical School Hotline is a monthly column from the John A. Burns School of Medicine and is edited by Satoru Izutsu PhD; HJMPH Contributing Editor. 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.

Good evening Colleagues, Friends, Family, and the entering John A. Burns School of Medicine Class of 2017.

It is truly my honor and privilege to speak to you tonight. When I received the Leonard Tow Award* earlier this year, I had no idea (1) what it was and (2) that it meant I would have to give this keynote address. I really wasn't sure what I was going to say, so my friend told me to use this opening line: “I just flew in all the way from Hilo and boy are my arms tired!”

The Leonard Tow Humanism in Medicine Award** was established by the Arnold P. Gold Foundation, whose motto is “Working to keep the CARE in healthcare.” And really, caring for people is the foundation of our profession.

As I stand here looking at all of you tonight, I can remember all the emotions that you are feeling right now: excitement, pride, and perhaps a wee bit of nervousness. The medical field is most certainly challenging. There is so much to learn: anatomy, diseases, pathophysiology, pharmacology, diagnostic skills, clinical skills, treatment plans, how to remember all the names of medications, their dosages, and what they are used for. Treatments and guidelines are always changing. Insurance companies and paperwork are a total nightmare. There is SO MUCH to learn. Your four years here will fly by and you will feel like you have not had enough time to learn everything that you need to, then you will be thrown into residency where you will continue to learn and grow, but it will still not seem like enough. Then you are suddenly thrust into the real world where the lives of patients are literally in your hands. Their lives will depend on your fund of knowledge, the skills you learn and practice, and the advice you give. It is a huge and stressful responsibility. Now the wee bit of nervousness you felt has probably just escalated into a full-blown panic attack, which, by the way, is not an uncommon feeling as a first year med student. Somewhere in your four years of medical school, you will probably diagnose yourselves with diseases that fit your symptoms of mental cloudiness, fatigue, and generalized weakness. I think 50% of people in my class thought they had lupus or multiple sclerosis. But I digress... There is so much to learn. The great thing about medicine, though, is that you never stop learning. You will be a lifelong learner, and this is a very valuable skill.

In your journey of learning, you will have many great teachers. Your faculty at JABSOM will educate you and guide you. Your

classmates and colleagues are irreplaceable: you will teach each other, learn from each other, support each other through tough times and challenges, and celebrate triumphs together. Nurses, ward clerks, respiratory therapists, lab personnel: right now, they all know more than you, so learn from them, be humble and be kind, offer them food, because if they do not like you they will make your life a living hell.

Of all the great teachers you will encounter, however, your best teachers will be your patients. I have been out of medical school for 15 years now and not a single day has gone by that I haven't learned something new or valuable from a patient.

A number of 3rd year medical students have done their family medicine rotations with me in Hilo, and one of them asked me, “What was your ‘A-Ha’ moment?” I was like, “Huh?” and he said, “You know, that moment when you knew why you went into medicine and that you made the right choice.”

My A-Ha moment. Hmm. I remember it clear as day. I had just started my 3rd year at JABSOM and was super excited to finally be working at the hospital and doing hands-on work with actual patients, so I was going to go for it, sign up for the hardest rotations, get pummeled and learn as much as I could. So for my very first rotation of 3rd year, I signed up to do surgery at Queen's. Back then we didn't have limitations on our hours or the amount of overnight call we did, so the three of us who were assigned to Queen's were scrubbed into surgery all day, and every third night we were up all night on trauma call. It was tiring and overwhelming, but I was learning and it was really fun in a masochistic sort of way. On the 2nd day of our rotation, we were assigned to scrub into the big surgical cases of the day. I was totally stoked because I was going to scrub into a Whipple procedure (the granddaddy of all big surgeries, a potential treatment for pancreatic cancer) with the chief resident and the director of surgery at Queen's. The first thing you have to do is a pre-operative history and physical. So I walked into this particular patient's room, bright and early on the first “real” day of my surgery rotation. The patient looks at me and says, “And who the hell are you? And what the hell do you want?” “Ai carumba,” I thought to myself as a bead of sweat started to roll down my forehead. So I tried my best to explain that I was the medical student assigned to his case and that I would be in the OR but by no means would I be doing any cutting or stitching whatsoever, and I managed

to get a fairly decent H&P from him and his wife. A few hours later, we wheeled him back for surgery. I had prepared myself for what is usually a 5-8 hour surgery, but unfortunately, when we opened him up, he had metastatic tumors scattered all over his omentum and bowel. The Whipple procedure had turned into a bypass procedure to keep him comfortable and keep him from getting more jaundiced. After the surgery, I was present when patient and his family were given the bad news. I didn't know what to say or do so I went to the bathroom afterwards and cried.

During our surgery rotation, we had to round on the patient twice a day: once before 6am rounds, and again in the afternoon before we left. Med students have to do rounds before the intern, who needs to round before the upper level, who needs to round before the chief, who reports to the attending. So I would round on this poor patient at 4:30 every morning. Every morning he would say, "What, you waking me up again, sheesh, the vampires (lab guys) just left!" In the afternoons, he was usually awake and his family was there so we would talk story for a bit and I would try to answer their questions, always emphasizing that I was only the student but, in true PBL fashion, I could look it up and get back to them. One morning I walked into his room in the dark, and surprisingly, he was awake. "I've been waiting for you," he said. "Try go over there by the foot of the bed. My wife and I have something for you." There, on the table, stood a small blue Tiffany bag. "Well, open it," he tells me. I open the bag and pull out a beautiful blue glass heart-shaped paperweight. I just stood there with my mouth open and he told me, "You know, all day long people come in and out of this room, waking me up, asking questions, poking, prodding, etc, etc. And of all those people who come in and out of this room, you are the only one who really takes the time to talk story, really ask me how I am feeling and seem to give a crap about it, listen to me grumble, and try to answer questions even though I'm really not sure you know what you're talking about. You have a very hard job ahead of you. It will be stressful and it will wear you down. It might make you depressed and jaded and uncaring. But when you look at this heart paper weight, you remember that you have heart, and your patients need to

see this. This is your gift. This is why you went into this field. **DO NOT EVER LOSE HEART.**" I met Mr. Lee on the second day of my surgical rotation. He passed away on the second to the last day of my rotation. Sixteen and a half years later, his wife still sends me a Christmas card. I have learned many things from great teachers, but this by far, was the one lesson I have never forgotten.

Being a physician is not only about making the right diagnosis and prescribing the right treatments for your patients. Part of your job as a physician is to remember that your patients are human beings, not just numbers or statistics or a diagnosis. As physicians, your patients and your community will always respect you, but when you truly care and reach out to them with a compassionate hand and heart, they will embrace you. And when this happens, you will feel that you have indeed made a difference in their lives, and you, too, will have your "A-Ha" moment.

Stand tall, student doctors: you have made it this far. Keep standing strong: your journey is just beginning. Congratulations, class of 2017.

* Dr. Arakaki was nominated and selected by the students (Class of 2013) and their advisors.

**The Mission of the Arnold P. Gold Foundation is "to perpetuate the tradition of the caring doctor by emphasizing the importance of the relationship between the practitioner and the patient. Our objective is to help physicians-in-training become doctors who combine the high tech skills of cutting edge medicine with the high touch skills of effective communication, empathy and compassion."

"Our (the Foundation's) inspiration emanates from the leadership of Dr. Arnold P. Gold, role model physician, mentor and the guiding force of our work. Arnold's vision places people and relationships at the center of every healthcare interaction. Toward that end, he believes that given proper instruction, a clear set of expectations, personalized mentoring and recognition and rewards, doctors in training will acquire the 'habit of humanism' and thereby improve patient care and healthcare outcomes."

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INSIGHTS IN PUBLIC HEALTH

Project Kealahou — Forging a New Pathway for Girls in Hawai‘i’s Public Mental Health System

Lesley A. Slavin PhD and Edward Suarez PhD

Insights in Public Health is a monthly solicited column from the public health community and is coordinated by HJMPH Associate Editors Jay Maddock PhD from the Office of Public Health Studies at John A Burns School of Medicine and Donald Hayes MD, MPH from the Hawai‘i Department of Health in collaboration with HJMPH Manuscript Editors Tonya Lowery St. John MPH and Ranjani R. Starr MPH from the Hawai‘i Department of Health.

Over the past two decades, the State of Hawai‘i has worked to overhaul its Mental Health Services for Children and Adolescents and to provide comprehensive evidence-informed services for children and families through a system of care (SOC) approach. Despite major accomplishments, the state continues to struggle to achieve results for certain populations. This article will describe recent and on-going efforts by a grant-funded initiative to address the special needs of one of these groups: girls who have experienced significant trauma. This initiative includes a strong evaluation component that is linked to a large national data collection effort by the Substance Abuse and Mental Health Services Administration (SAMHSA). It is expected that results of the evaluation will be published in the near future.

Similar to children’s mental health service systems across the country, Hawai‘i has been challenged by the need to join efforts to serve youth across mental health, child welfare, education, and juvenile justice systems. The Hawai‘i State Department of Health’s (DOH) Child and Adolescent Mental Health Division (CAMHD) recognized that the need for coordinated efforts and an effective system of care approach is particularly acute in the area of understanding, engaging, and serving girls with histories of trauma. This group is at the greatest risk compared to any other population for suicide, self-harm, running away, truancy, pregnancy, prostitution, and further victimization.¹⁻⁴ CAMHD data show that between 18% and 44% of girls with identified trauma histories are served in out-of-home treatment settings. These girls also present a major dilemma to the juvenile justice system. They are often seen in court due to “status offenses” such as truancy or running away, and they end up in detention facilities or being incarcerated despite having engaged in minimal criminal behavior. These girls often enter the “revolving door” of systems, moving in and out of residential placements, hospitalization, foster care, incarceration, and re-exposure to violence.²

Recognition of the specialized needs of this population led CAMHD leaders to apply for federal funding to test a service model specifically designed for girls exposed to trauma. Project Kealahou was designed to address a number of gaps in the standard care available to such girls in Hawai‘i by:

- Systematically identifying girls exposed to trauma and recognizing that many of their behavioral issues are rooted in trauma;
- Addressing trauma issues, including behavioral problems rooted in trauma, through individualized plans of care and a systems-of-care approach;
- Utilizing gender-responsive and culturally relevant engagement and social support practices that involve families and extended families;
- Providing adequate evidence-based treatment approaches for trauma;
- Developing effective mechanisms to build cross-agency service integration and collaboration, in order to overcome interagency conflicts and fragmented care.

Beginning in 2010, CAMHD became one of 29 sites across the United States to receive funding under the auspices of a six-year (2010-2016) Cooperative Agreement with SAMHSA as part of the Children’s Mental Health Initiative’s (CMHI) system of care program. Approximately twenty full-time-equivalent positions have been created within CAMHD to implement the Project in three of O‘ahu’s four CAMHD service catchment areas, ie, East Honolulu, Windward O‘ahu, and Central O‘ahu.

System of Care Approach

Systems of care mark an important departure from traditional mental health service delivery in that they require systems to embrace the core values of being child-centered, family-focused, community-based, and culturally competent.⁶ In addition, systems of care reflect the core value-based principles of (1) individualized and strength-based services; (2) readily available services in least restrictive environments; (3) integrated and coordinated services, with collaboration from families and service providers; and (4) early identification and intervention.⁷ The SOC movement is more than coordinated services, it is a philosophy that supports helping each child reach their full potential by recognizing the importance of family, community, and schools to address the multiple and complex needs of children in a culturally competent and coordinated manner.

In Hawai‘i, as in other jurisdictions across the country, child-serving agencies have developed separate models of care with differing mandates that often result in a “silo” effect. Youth and families with complex needs do not fit neatly into the silos; what often results is fragmented care as each agency is only concerned with their specific mandates.⁸ A true SOC must breakdown the silos and plan across agencies to support youth with serious mental health needs and their families in meeting their needs and achieving their goals.

Imperative Need for Gender-Specific, Trauma-Informed Systems of Care

National research suggests that girls are at greater risk than their male counterparts for particular life stressors.⁹⁻¹¹ These include specific events such as sexual abuse, which may require interventions tailored to the unique psychosocial and interpersonal characteristics of girls. Girls who have histories of trauma resulting in emotional and behavioral symptoms pose a service delivery challenge to mental health, education, child welfare, and juvenile justice systems. They are at greater risk than boys for running away, truancy, suicide, teen pregnancy, prostitution, and further victimization despite intervention efforts.^{12,13}

Furthermore, there is a growing body of literature detailing the links between violent victimization, abuse, posttraumatic stress disorder, and arrests/involvement in the juvenile justice system, in turn leading to a host of other issues, including suicide, and increased rates of pregnancy.^{10,15-18} These patterns of behavior are often indicative of underlying familial discord, trauma histories, and general emotional and/or behavioral dysregulation, which require intensive treatment and support.^{13,19,20}

Research from multiple disciplines suggests that attending to the ways in which gender differentially impacts emotional and behavioral outcomes for boys and girls may be a key to developing more effective efforts to improve the lives of young people.²¹⁻²³ For instance, recognizing a girl’s need to find a safe environment and cultivate close relationships may be integral to designing successful programming for girls. Additionally, the American Psychological Association’s *Guidelines for Psychological Practice with Girls and Women* (2007) recommend that mental health professionals and juvenile justice systems focus more attention on the interaction between gender and culture.²⁴

Changes Being Implemented

Hawai‘i’s SOC initiative is called Project Kealahou, which in the Hawaiian language means “the new pathway.” This new pathway builds common trauma-informed practices across Hawai‘i’s child-serving systems and moves the service system forward to address the complex needs of girls who have trauma histories. The project builds on CAMHD’s existing partnerships and practices by adding components which are largely missing from the current system in order to create opportunities to change life trajectories of girls who have been traumatized.

Project Kealahou embodies system of care practices and a strengths-based, coordinated effort across system partners, including:

- Systematic identification of girls with trauma issues across child serving agencies;
- Provision of comprehensive mental health and trauma assessments;
- Utilization of a wrap-around approach for comprehensive coordinated service planning that is family-driven and youth-guided; assurance that each agency plan is fully integrated into each girl’s coordinated service plan;
- Coordinated intensive case management across all involved agencies and support needs;
- Ready access to comprehensive, effective, and accountable evidence-based, trauma-focused, culturally-informed services and supports;
- Fostering of culturally-informed service approaches, assured through a Cultural Specialist;
- Full involvement of families and youth in both services and project implementation through roles in evaluation, governance, peer partner and parent partner supports;
- Employment of blended project staffing that includes clinicians, intensive case managers, family and youth partners, and a liaison to the O‘ahu probation officers;
- Partnering with other child-serving agencies to work towards blended/braided funding and shared administrative approaches;
- Development of gender and trauma-informed practices and policies across public agencies and the community.

Project Kealahou is coordinated by DOH-CAMHD with strong partnerships with the Department of Education (DOE), Family Court (FC), Office of Youth Services (OYS), the Department of Human Services- Child Welfare Services (CWS), Hawai‘i Families as Allies (HFAA), the University of Hawai‘i (UH) and provider agencies. Project Kealahou aims to partner with CAMHD, DOE, FC, OYS and CWS to build sustainable pathways for the delivery of cross-agency care management, through mechanisms such as promoting multi-agency case planning processes, cross-agency workforce development training and data sharing agreements. Along with these child serving agencies, family members and youth are full partners in the governance of the project, developing and implementing the strategic goals of the project and evaluating the progress and success of the project’s initiatives. Representatives from each of these entities participated in the development of the initial grant proposal for the project, and a focus group was conducted with detained girls to inform strategies for building a viable trauma-informed system of care.

Target Population

The target population for this project is girls with serious emotional disturbances and significant trauma histories in the child welfare, juvenile justice, educational, and mental health systems in the Central, Windward, and East Honolulu catchment areas of the island of O‘ahu. Previously CMHI-grant funded areas of

Leeward O‘ahu and West Honolulu (Farrington, Roosevelt and McKinley school complexes) are ineligible for these services due to the requirements of the grant program. Girls ages 11-18 will be accepted into the program, and they may stay in the program until age 21.

Project Kealahou is planning to enroll up to 500 participants over 5 years of services implementation, with referrals coming primarily from the four major child-serving agencies: CAMHD, Juvenile Justice (ie, Family Court, Girls Court, Youth Corrections and Probation), Department of Education (DOE), and Child Welfare Services (CWS). Through Project Kealahou, these four child-serving agencies and community partners will increase their awareness of the role of trauma in youth’s emotional/behavioral difficulties, their understanding of the importance of family and youth engagement, their ability to

assure youth’s access to appropriate services including culturally relevant services, and their knowledge about appropriate services and supports to be provided.

Implementation Plan

Project Kealahou is working to address the gaps in our current system for girls with histories of trauma on two levels. (1) At the direct service level, Project Kealahou is working to develop and enhance mental health services for traumatized girls. (2) At the larger system level, Project Kealahou is working to improve the degree of integration, collaboration and shared understanding of trauma among major state agencies involved in caring for these girls. Table 1 contains a project summary illustrating the direct service level and system level interventions, and describing the overall project implementation plan.

Table 1. Project Kealahou (PK) Objectives		
GAPS	How the Project works with Girls	How the Project works with the System
Traumatized girls are under-identified and the role of trauma in youth’s difficulties is not well-understood.	<ul style="list-style-type: none"> • Outreach/social marketing to all agencies and relevant cultural groups for referrals. • Trauma screening for all referred girls. 	<ul style="list-style-type: none"> • PK and Governing Council assure shared training in understanding trauma for staff across a range of child-serving agencies.
Youth and Family are not engaged consistently and don’t drive treatment.	<ul style="list-style-type: none"> • Engagement process includes peer and family support specialists. • Female staff works with the youth. • Project staff works with other service providers to increase engagement. 	<ul style="list-style-type: none"> • PK and Governing Council explore and recommend models of cross-agency shared care coordination.
Cross-agency collaboration is perfunctory; girls’ treatment is stalled because multi-agency teams can’t agree.	<ul style="list-style-type: none"> • PK clinical staff works with service providers to facilitate effective team work in stuck or contentious cases. 	<ul style="list-style-type: none"> • PK co-trains Family Court along with clinical staff. • PK provides cross agency training on: system-of-care principles, strength-based approaches and trauma-informed care.
Most mental health providers are not trained in and do not utilize effective evidence-based trauma treatment approaches.	<ul style="list-style-type: none"> • PK/CAMHD staff and other providers receive training in Trauma-Focused Cognitive-Behavioral Therapy (TF-CBT). • Expert consultants provide on-going support to trained clinicians. 	<ul style="list-style-type: none"> • Training capacity is established within the state to provide on-going training in TF-CBT. • Training is provided to DOE and the private practice community to assure access to trauma treatment in lower levels of care.
Services are not culturally resonant for the population served.	<ul style="list-style-type: none"> • PK staff represents a range of ethnic and cultural backgrounds. • PK Cultural Specialist works with clinical staff to modify the program’s approach for Hawai’i’s cultural groups. 	<ul style="list-style-type: none"> • Governing council membership is chosen to assure wide range of cultural perspectives. • Outreach to engage groups with strong ethnic or cultural ties to specific parts of the community.
Lack of advocacy by youth and “youth voice.” Treatment Plans are not “youth guided.”	<ul style="list-style-type: none"> • A paid “Peer Support Specialist” helps girls “own” their plans and guide their teams. • Peer Specialists “at the table” in all project decision-making. • Peer Specialists receive active support from PK Youth Coordinator. 	<ul style="list-style-type: none"> • Youth are members of the Governing Council and are compensated for their time in council meetings. • Peer Specialists are co-trainers with other project staff at cross-agency training events to represent youth perspectives on agency practices.
Lack of interventions that are effective and gender-responsive.	<ul style="list-style-type: none"> • Girls Circle groups provided in all three regions. • Project develops links with local youth development groups (YWCA, Hula Halau, Paddling groups, etc) and involves girls in pro-social activities. • Project staff is mostly female. • Quality and safety of relationships is a priority. • Girls have choices about whom they will work with in therapy and which program they will attend. 	<ul style="list-style-type: none"> • Governing council explores ways to develop increased access to community-based activities for youth receiving help from social service agencies. • PK provides training on gender-responsive programming across agencies.

Evaluation Plan

The wide variety of information being gathered for this project can be summarized into five major categories. First, population information addresses the characteristics of the youth and families that are served. Second, service information is compiled regarding the type and amount of direct care services used by children, youth, and families. Third, financial information is gathered about the cost of services. Fourth, system information is collected about the quality and operations of the infrastructure needed to support and sustain the enhanced youth and family services. Finally, outcome information is examined to determine the extent to which services provided lead to improvements in the functioning and satisfaction of youth and families.

Data from the evaluation of Project Kealahou will be used to improve service systems by examining several domains of performance in comparison to national results (from other currently and formerly funded CMHI sites) regarding satisfaction with services, clinical outcomes, juvenile justice encounters, school functioning, caregiver strain, and family life. The evaluation of data will lead to an increase in quality of service delivery by providing information on which services are more likely to lead to positive outcomes for girls and where service gaps still exist. Evaluation data along with feedback gathered through process evaluation efforts from family members and stakeholders will also be used to develop local policies to create a better system of care for girls with trauma and to ensure sustainability of the trauma-informed system of care beyond the 6-year project.

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10/21-10/24	Scientific Symposiums International	Hapuna Beach Prince Hotel, Mauna Kea, Big Island	Diagnostic Dermatopathology: Correlating Clinical and H and E Findings Is Not Enough	http://www.scientificsymposiums.com/course_details.php?cid=42
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WHEN OBESITY BECOMES OBSCENITY.

The fire department in Elgin, Illinois, wants to buy a mechanized ambulance lift that can pick up a patient weighing 700 lbs. The system costs \$32,000 but would cut down on the number of personnel needed to take a morbidly obese patient to the hospital. Battalion Chief McMahan stated that such calls used to be rare, but now come several times a month. As many as nine workers arriving in three vehicles, are required for transport. The department found that since 2010, injuries to backs, arms and shoulders of responders cost more than \$329,000 in worker compensation claims.

IT WAS NO USE, THE EUROPEAN UNION STILL BANS SNUS.

In 1992, the European Union placed a ban on Snus, a moist, powdered tobacco placed between the cheek and gum as an alternative to cigarettes. When Sweden joined the E.U. in 1995, it was with the express provision that their country be exempted. Now the exemption would like to eat the rule. For the past year, Sweden has been attempting to lift the embargo, potentially opening up a \$2.3 billion market. Swedish Trade Minister Ewa Bjorling argued that the E.U. commission has ignored scientific research indicating that Snus is less harmful than other forms of smoke-free tobacco or cigarettes. In Sweden, cigarettes are puffed by 11% of the population, less than 2/3 the rate of 18% of the rest of the E.U. The Swedish risk of dying by tobacco-related disease is also smaller than any other E.U. nation. Proving that logic has no place in government regulation, the request fell on deaf ears.

FOOD CHALLENGE: TRY TO FIND A BREAKFAST CEREAL WITHOUT ADDED SUGAR.

The National Center for Health Statistics released dietary guidelines for discretionary calories, including added sugars and solid fats. The recommended limitation is between 5% and 10% of daily caloric intake. Recent analysis showed that children and adolescents get 16% of their calories from added sugars, while the figure for adults is 13%. Interesting findings: males age 60 and beyond were lowest at 11% while the 20-40 age group was 14%. A similar pattern and percentages were reported in women. Another correlation was higher income yielded lower percentage at 12% and lowest income got 16% of daily calories from added sugars.

WHY DIDN'T MOTHER NATURE MAKE THE MOSQUITO A VEGETARIAN?

What we don't need in our island home is this newcomer from Southeast Asia. *Aedes albopictus* traveled from its native habitat, hitch-hiking as larvae in pools of rainwater in stacks of used tires. Recycling used tires has become big business worldwide. This aggressive hit-and-run mosquito frequently lives in close contact with humans, and dines on humans, dogs, livestock, birds and a host of wild animals. Named tiger because of its black and white stripes, *A. albopictus* can serve as a vector for dengue, yellow fever, chikungunya virus, West Nile fever and two forms of encephalitis named for St. Louis, Mo., and LaCrosse, Wis. Only yellow fever is preventable by vaccine. The tiger mosquito has been reported across the south below the Mason-Dixon line and as far north as New York and west to Texas. Dengue has already gotten a toehold in some southern states, and has been reported in Hawai'i.

TRANSPLANTATION ART REQUIRES KNOWING THE DONOR.

A previously healthy man returned from a fishing trip and developed nausea, vomiting and upper extremity paresthesias over a four-day period. He was seen in the ER with a fever, elevated WBC, and low sodium and potassium. Shortly after arrival he had a seizure and was admitted to the hospital. He had dysphagia to liquids, altered mental status, and autonomic dysfunction with hemodynamic instability. He was declared brain dead 17 days after the onset of symptoms with a presumed diagnosis of ciguatera poisoning. Organs were harvested

for kidney, liver and cardiac transplant. Seventeen months later, one of the kidney transplant patients presented to the ED with right hip and lower extremity pain. He was discharged with a diagnosis of sciatica, but returned four days later with fever, weakness, and right lower abdominal pain at the site of the transplant. He progressed to ascending paresthesias, encephalopathy, excessive salivation and autonomic instability. He was found to have rabies and died 22 days after admission. Retrospective analysis of donor's body fluids and work history revealed a raccoon source of rabies infection. The other three recipients of potentially rabid transplants were treated with post-exposure prophylaxis and remain well.

DOES AMERICA HAVE A PILL-TAKING CULTURE OR WHAT?

Melatonin is a naturally produced hormone that is released to regulate our sleep and wake cycles. Insomniacs and jet-lagged flyers have used synthetic melatonin supplements as a sleep aid for years. An article in the *Annals of Neurology* in 1991 reported that melatonin successfully corrected a blind child with multiple disabilities. Melatonin came into popular use in pediatrics for both special needs and healthy children as well. Because the drug appears to have a good safety record, many parents find it useful for their children on a continuing basis. Stuart Ditchek, clinical professor of pediatrics at New York University School of Medicine said, "I've never seen such widespread abuse of any drug or therapy in all my years of practice." *Nutrition Business Journal* put sales of Melatonin at \$260 million in 2012, compared with \$90 million in 2007, a nearly three-fold increase.

JUST WHAT AMERICA DOESN'T NEED, ANOTHER ELECTRONIC DISTRACTION.

If you are a member of the "latest gadget club" in 2014 you can spend about \$1500 and own the Google Glass. This futuristic eyewear puts a tiny voice-controlled Wi-Fi enabled computer on your face. Soon you will be able to view e-mails, text messages and maps on a translucent screen suspended in the upper right corner of your peripheral vision. Breaking news alerts will appear before your eyes. You will be able to take a picture with a voice command. Google claims (hopes?) that there will be thousands of dorky-looking Google Glass wearers over the coming months taking pictures, giving verbal commands and viewing their e-mail.

WHAT GOES UP MAY NOT STAY UP.

The US Food and Drug Administration wants certain drug labels changed to reflect complaints of patients taking finasteride (Proscar, Rogaine). A clear causal relationship has not been established, but the use of prostate and baldness drugs are linked to sexual malfunction. Drug labels have been updated to note the possibility that users may experience decreased libido, erectile dysfunction, and ejaculation and orgasm disorders. There is always a price to pay.

THIS IS FIRST CLASS MAIL DELIVERY.

In Brunete, Spain, near Madrid, complaints of dog droppings in public areas have decreased dramatically. The county council employed volunteers to obtain the names of derelict dogs. The names were recorded with the owners' addresses. The un-scooped droppings were packaged and mailed to the owners as "lost property."

ADDENDA

- Phineas T. Barnum staged the first international beauty contest in 1854. It was closed down by public protests.
- LeBron James has a vertical leap of 40.3 inches.
- Papa Hemingway is said to have consumed 13 daquiris in one sitting. We aren't told if he was able to stand.
- News item: the Loch Ness monster surfaced today and asked if there were any facebook or twitter messages for her.
- If you get cheated by the Better Business Bureau who do you complain to?

ALOHA AND KEEP THE FAITH rts

(Editorial comment is strictly that of the writer.)



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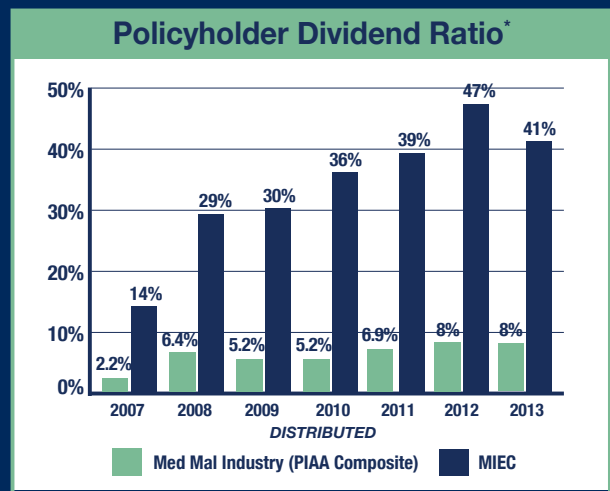


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