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HAWAI‘I JOURNAL WATCH

Karen Rowan MS

SOCIOECONOMIC AND BEHAVIORAL FACTORS ASSOCIATED WITH OBESITY ACROSS SEX AND AGE IN HONIARA, SOLOMON ISLANDS

Chihiro Tsuchiya MHS; Takuro Furusawa PhD; Samo Tagini RN;
and Minato Nakazawa PhD

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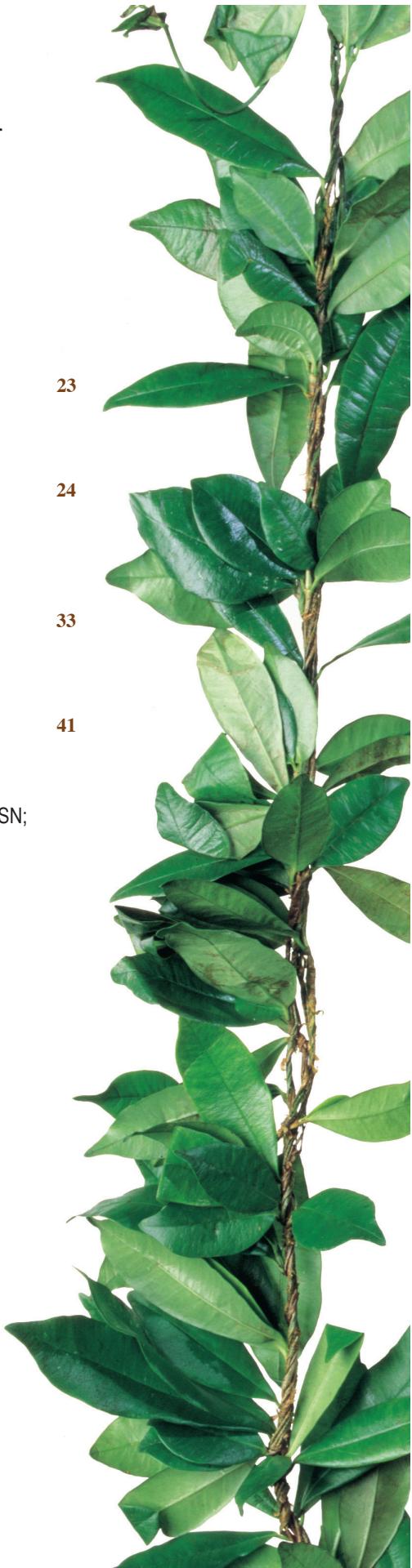
AN ANALYSIS OF HEALTHY FOOD ACCESS AMONGST WOMEN IN PERI-URBAN HONIARA

Penny Farrell PhD; Anne Marie Thow PhD; Mia Rimon MPPM; Andy Roosen PhD;
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INSIGHTS IN PUBLIC HEALTH

Interdisciplinary Student Team from University of Hawai‘i at Mānoa in the HI-EMA Community Care Unit: Identifying Needs in the Pandemic and Learning Together

Sydney Unciano BS; Angel Lynn Talana BS; Fary Maldonado MPA; Kira Oyama RN, MSN;
Chelsea Emma Apo RN; Kristine Qureshi PhD,RN,CEN,PHNA-BC,FAAN;
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HAWAII JOURNAL WATCH

KAREN ROWAN MS

Highlights of recent research from the University of Hawai'i and the Hawai'i State Department of Health

NEW COMPOUNDS IDENTIFIED IN MAUNA KEA SOIL

Soil from the top of Mauna Kea contains fungi that may produce anti-cancer or cancer preventative compounds. Researchers including Shugeng Cao PhD, of the Daniel K. Inouye College of Pharmacy, studied a fungal strain called *Aspergillus terreus* FS107 from a soil sample using high performance liquid chromatography (HPLC). Six compounds were isolated, including 2 new compounds that the researchers named tryptoquivaline W and tryptoquivaline X. Their structures were determined using mass spectrometry and nuclear magnetic resonance analysis. The researchers then tested the activity of the compounds against human cancer cells. Among the 4 known compounds, 2 inhibited the activity of NF- κ B, a transcription factor involved in the cellular response to stress. The researchers concluded these compounds may potentially mediate a cancer chemopreventive response in human cells.

- Zaman KAU, Hu Z, Wu X, Cao S. Tryptoquivalines W and X, two new compounds from a Hawaiian fungal strain and their biological activities. *Tetrahedron Lett.* 2020;61(14):151730. doi:10.1016/j.tetlet.2020.151730

FACTORS ASSOCIATED WITH SURVIVAL OF RARE LIVER CANCER

Cancer of the liver and bile ducts, called combined hepatocellular and cholangiocarcinoma (HCC/CC), is an aggressive cancer with generally poor prognosis. Researchers including Eric Wien MD, of the John A. Burns School of Medicine, examined data from the Surveillance, Epidemiology, and End Results (SEER) database on 497 patients with HCC/CC from 2004 to 2015. Results showed median survival was 6 months. Multivariate logistic regression showed that tumor size of less than 50 mm, undergoing surgical resection, and undergoing liver transplant were associated with 5-year survival. Patients in the Asian/Pacific Islander group had a significantly higher rate of surgical resection compared with non-Asians (35.7% vs 21.1%), and a higher rate of 5-year survival (15.4% vs 8.0%). The greater prevalence of hepatitis B in Asia may play a role – it may prompt surveillance and earlier detection, or the virus may lead to cancers that develop without co-occurring cirrhosis, allowing for more surgical management. The researchers concluded that further study is needed to explain racial/ethnic differences and the role of underlying liver disease in patients with HCC/CC.

- Sempokuya T, Wien EA, Pattison RJ, Ma J, Wong LL. Factors associated with 5-year survival of combined hepatocellular and cholangiocarcinoma. *World J Hepatol.* 2020;12(11):1020-1030. doi:10.4254/wjh.v12.i11.1020

AN APP CAN FACILITATE HPV VACCINATION

Young men who have sex with men (MSM) face a higher prevalence of human papillomavirus (HPV) related diseases. Researchers led by Holly Fontenot PhD, of the School of Nursing and Dental Hygiene, developed an app to reach young MSM, deliver HPV

information, and facilitate vaccination. Participants ages 18-26 were recruited over 6 months via ads on an MSM dating app. Among 338 potential participants who accessed the study web page, 42 downloaded the app. Usage data showed participants primarily accessed the app's educational components and the app's functions to book appointments, set reminders, or access directions to clinics. Of the 35 participants who were unvaccinated, not up-to-date, or not reporting status, 8 (23%) used the app to facilitate receiving the HPV vaccine. The findings show that an app can help youth develop action plans and facilitate health behaviors.

- Fontenot HB, White BP, Rosenberger JG, et al. Mobile app strategy to facilitate human papillomavirus vaccination among young men who have sex with men: Pilot intervention study. *J Med Internet Res.* 2020;22(11):e22878. doi:10.2196/22878

BILE ACID METABOLISM MAY PLAY A ROLE IN ALZHEIMER'S DISEASE

Many metabolic processes are altered in people with Alzheimer's disease (AD). Researchers including Wei Jia PhD, of the University of Hawai'i Cancer Center, used data from post-mortem brain samples to create transcription profiles of genes involved in the metabolism of cholesterol and bile acids. From the profiles, the researchers analyzed metabolic activity in various brain regions. Results showed that the transport of the amino acid taurine, the synthesis of bile acids, and the metabolism of cholesterol differed significantly between the brains of people with AD compared with cognitively normal individuals. Moreover, the researchers identified transcription factors that interact with these genes. They also found evidence suggesting bile acids from the gut are transported to the brain. The researchers concluded more research is needed on bile acid metabolism in AD.

- Baloni P, Funk CC, Yan J, et al. Metabolic network analysis reveals altered bile acid synthesis and metabolism in Alzheimer's disease. *Cell Rep Med.* 2020;1(8):100138. doi:10.1016/j.xcrm.2020.100138

MORE FREQUENT VISITS TO A CHIROPRACTOR MAY HELP WITH CHRONIC PAIN

For patients with chronic low back or neck pain who are under the care of a chiropractor, visits more than once per week may be linked with better improvement. Researchers including Eric Hurwitz DC, PhD, with the Office of Public Health Studies, conducted a prospective study with 1665 patients over a 3-month period. Results showed patients' ratings of pain decreased slightly but significantly over the study period. Those with higher levels of pain and disability had more frequent visits, and those who saw their chiropractor more than once weekly showed significantly faster improvement. The findings suggest that patients may reach a plateau, or level of maximum therapeutic improvement, and that visits more often than once weekly are needed to maintain that level of improvement.

- Herman PM, Edgington SE, Sorbero ME, Hurwitz EL, Goertz CM, Coulter ID. Visit frequency and outcomes for patients using ongoing chiropractic care for chronic low-back and neck pain: An observational longitudinal study. *Pain Physician.* 2021;24(1):E61-E74.

Socioeconomic and Behavioral Factors Associated with Obesity Across Sex and Age in Honiara, Solomon Islands

Chihiro Tsuchiya MHS; Takuro Furusawa PhD; Samo Tagini RN; and Minato Nakazawa PhD

Abstract

The Solomon Islands is currently experiencing a change in disease burdens, from communicable to non-communicable diseases. Obesity is one of the leading non-communicable diseases causing death. Urgent action is needed to decrease the high economic and personal costs associated with obesity. This study proposes to determine behavioral and socioeconomic factors associated with obesity among different sex and age groups in an urban area of the Solomon Islands. In 2016, a cross-sectional study was conducted among adults aged 20 to 80 in Honiara, the capital of the Solomon Islands. Anthropometric measurements and a survey of socioeconomic status (SES) and behavioral status were conducted among 176 participants using a questionnaire. Multiple linear regression analysis was used to identify the socioeconomic factors significantly associated with higher body mass index (BMI) by age group. The study found a high prevalence of overweight (34%) and obesity (48%) in both sexes. Multiple linear regression analysis found that having a high-income level and being married were positively associated with higher BMI among young adults. In the middle age groups, the highest income level was positively associated with higher BMI. Young and middle-aged adults with a high SES might consume higher calorie food, contributing to weight gain, but this needs confirmation. Moreover, getting married might lead to more consistent meals and weight gain among the young age group. These findings suggest that health professionals have to consider the influence of income level and marital status on lifestyle choices when planning interventions that promote healthy lifestyles.

Keywords

Non-communicable diseases, Solomon Islands, obesity, developing countries, factor analysis, risk behavior

Abbreviations

BMI = body mass index

FDSK = food diversity score Kyoto

NCDs = non-communicable diseases

PIC = Pacific Island countries

SD = standard deviation

SES = socioeconomic status

Introduction

It has been estimated that of the 57 million deaths worldwide in 2016, 72% were caused by non-communicable diseases (NCDs) such as cardiovascular disease, cancer, chronic respiratory disease, and diabetes.¹ More than 78% of the mortality occurs in low-and middle-income countries that suffer the double burden of NCDs and communicable diseases.¹

Overweight and obesity are serious risk factors that contribute to cardiovascular disease, diabetes, and cancer. The Pacific Islands countries (PICs) region is composed of 22 countries and territories across Polynesia, Micronesia, and Melanesia. The highest prevalence of obesity and type 2 diabetes in the world is found there.² The Solomon Islands is one of the PICs that has experienced a striking rise in the prevalence of obesity.³ According to Friedlaender et al, obesity was not recognized as a problem in the 1960s.⁴ However, after independence from British rule in 1978, Eason, et al (1987), observed adult obesity in the urban areas of Western province.⁵ According to the 1989 National Nutrition Survey in the Solomon Islands, only 11% of the women were considered overweight and 3.5% obese.³ However, by 2016, according to the World Health Organization, the prevalence of being obese among women was 25% and among men 16%.¹ Currently, NCDs are estimated to cause 69% of the Solomon Islands' total deaths.¹

Since the end of World War II, the political and economic changes experienced in the PICs have been widely described.⁶ Dramatic transitions in the food environment due to modernization, migration, and urbanization have occurred in the Solomon Islands since independence from British rule.⁶ These transitions have, in turn, dramatically impacted dietary intake and physical activity, causing an increase in obesity and NCDs in the islands.⁵ The diet of the Solomon Islands was traditionally based on root crops, fruits, seafood, vegetables, coconut products, and various nuts.⁷ However, consumption of higher energy-density refined cereals, animal products, oil, and processed foods has significantly increased.⁷ This nutrition transition is associated with the rising burden of NCDs.⁷ Rising incidence of NCDs in the Solomon Islands is also impacted by other factors, including negative lifestyle behaviors seen in unbalanced diets, lack of physical activity, drinking, and smoking.⁷ Another factor is that obesity is widely considered to affect people of lower socioeconomic status (SES) more than those of higher SES worldwide.⁸

The distribution of health-related behaviors is usually affected by age and gender.⁹ Considering gender-and age-specific socioeconomic status and behavioral patterns might help health professionals focus on early prevention programs on the most important and cost-effective risk factors. However, there is little information about the factors associated with obesity by sex in the Solomon Islands. Therefore, the objective of this study is to determine the socioeconomic and behavioral factors as-

sociated with obesity differentiated by sex and age in an urban setting in the Solomon Islands to develop effective obesity prevention techniques.

Methods

Study Area and Population

The Solomon Islands is part of the Melanesian group of countries located in Oceania, northeast of Australia. According to the Solomon Islands National Statistics Office, in 2019, its population was approximately 680 806, with 13% living in Honiara, the capital, situated in the main province of Guadalcanal (Figure 1).¹⁰

Design and Subjects

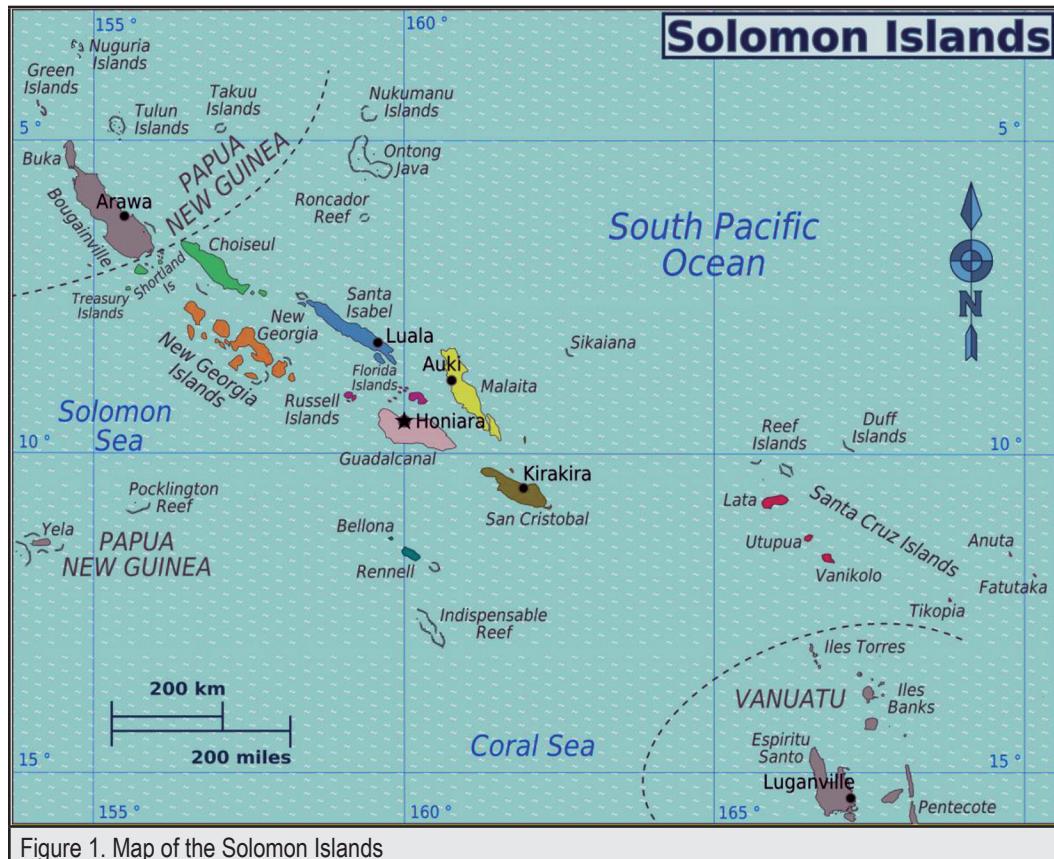
A cross-sectional study was conducted with 176 participants in an area health center in Honiara. The study recruited adult outpatients aged 20 or over at the clinic with informed consent and without incentives. The subjects were patients visiting the clinic between July 1 and 31, 2016. The subjects were recruited through a convenience sampling of general department patients, an outpatient facility that provides diagnosis, treatment, injections, and counseling services. Pregnant participants were

excluded. The following items were investigated for all subjects: anthropometric measurements and interviews on socio-economic status. A semi-structured, interviewer-administered questionnaire was divided into 3 sections: socio-demographic characteristics with 5 questions, nutrition status with 11 questions, and lifestyle behavior with 3 questions. The anthropometric measurements took 10 minutes, and the interview took 30 minutes. The cultural acceptability of the questions was confirmed through a pilot study with several local people. The surveys were conducted through one-on-one interviews by a Japanese researcher fluent in Pidgin, the common language of the Solomon Islands.

Anthropometric Measurements

Height was measured using a 0.1 cm precision Seca 213 Portable Stadiometer (model 213, SECA, Germany). Weight was measured using a 0.1 kg precision portable scale (BC-705N, TANITA, Japan).

The participants were asked to wear minimal clothing and no shoes or socks. Body composition was defined using body mass index (BMI) in kg/m², and normal weight was defined as BMI lower than 25, overweight as BMI 25–29.9, and obesity as BMI higher than 30.¹¹



Socioeconomic Status

A one-on-one interview was conducted with a questionnaire of 22 questions to obtain data consisting of age, sex, occupation, marriage status, household income level, and education level between July 1 and July 31, 2016. Age was categorized into 3 groups: young adult (20–39 years), middle adult (40–59 years), and older adult (60 years or older) following the National Health and Nutrition Examination Survey in the United States.¹²

Education level was categorized into 2 groups: low, consisting of those who did not go to school or only completed primary school or less, and high, those who went to secondary school or higher. Income level was categorized into 3 groups: low, middle, and high. The Wages and Benefits Survey, conducted by the Solomon Islands Chamber of Commerce and Industry, which targeted approximately 80% of the Solomon Islands private sector workforce, revealed the average employee wage per hour by skill level: unskilled (8.8 Solomon Islands dollars [SBD]), casual (12.5SBD), clerical (14.7SBD), skilled (28.0SBD, and management (54.0SBD).¹³ Thirty-seven percent of employees worked 7 hours per day, and 67% worked 8 hours per day.¹³ Based on the survey, the casual and unskilled employees were categorized as the low-income group earning 999SBD or less every 2 weeks.¹³ Skilled and clerical were categorized as the middle-income group earning 1000SBD to 2999SBD every 2 weeks.¹³ Management were classified in the high-income group, with earnings over 3000SBD every 2 weeks.¹³

Behavioral Status

A one-on-one interview was conducted with a questionnaire which consisted of items regarding smoking (Never, 1–2 days/week, 3–4 days/week, 5–6 days/week, 7 days/week) with the question “How many days per week did you smoke during the past week?” and alcohol drinking behavior (Never, 1–2 days/week, 3–4 days/week, 5–6 days/week, 7 days/week) with the question “How often did you drink alcohol during the past week?” following a questionnaire from a previous study.⁷ We did not ask about betel chewing in our interviews. Exercise frequency was estimated using the rapid assessment of physical activity scale, a useful tool to assess physical activity used by a previous study in the Solomon Islands.^{7,14} The question items were carefully checked by multiple specialists in this area for content validity. The questionnaire seemed suitable for the Solomon Islands people because most respondents gave valid answers with few omissions in the pilot study.

Nutrition Status

Nutrition status was investigated using the 11-item Food Diversity Score Kyoto (FDSK) questionnaire, which was developed to easily assess nutritional intake in a community setting without

complex measuring or the necessity to remember exact details.¹⁵ It covers all basic food items eaten in the Solomon Islands and has been used successfully in the Solomon Islands, China, Thailand, and Japan; and thus, was deemed appropriate for our survey.^{7,16–20} The questionnaire consists of 11 food items (grains, potatoes, vegetables, meat, fish, dairy products, eggs, beans, seaweed, fruits, nuts) and asks the frequency of consumption of these foods in an average week over the previous 6 months (Hardly eat [0 days/week], Sometimes [1–2 days/week], Often [3–4 days/week], Everyday [6–7 days/week]).

Ethical Considerations

This study was conducted following the guidelines of the Declaration of Helsinki and was approved by the Ethics Committee of Kobe University (project number 475) and the Solomon Islands Health Research and Ethics Review Board, Ministry of Health and Medical Services (HRE No. 034/16). All participants were provided written information outlining the nature and purpose of the study, and oral informed consent was obtained from all participants.

Statistical Analysis

Statistical analyses and calculations were conducted using R software with the EZR package.²¹ Student's T-test and Chi-squared test were used for univariate comparisons between men and women. Students' T-test and Fisher's exact test were used for univariate comparisons among age groups. Multiple regression analysis was used to identify separate age group factors significantly associated with higher BMI among explanatory variables, including education level, income level, occupation, and marriage status, while the effects of age and sex were adjusted.

Results

Sample Size and Characteristics by Sex

Sample means and proportions of the characteristics of the participants ($n=176$) were calculated separately for men and women (Table 1). The participants were 43% ($n=75$) men and 57% ($n=101$) women. Mean age was 43 ± 15 years among men and 40 ± 12 years among women. Significant differences between the sexes were observed in BMI, weight classification, education level, and occupation. The mean BMI was significantly greater in women (32 ± 6) than in men (29 ± 5) ($P<.001$). The prevalence of overweight was 41% among men, and 29% among women and obesity was 35% among men and 58% among women, and women had a significantly higher prevalence of obesity ($P=.006$). Men had significantly higher education levels ($P=.033$) and were more likely to be employed compared to women ($P<.001$).

Demographic and Socioeconomic Characteristics by Sex and Age Group

Table 2 shows the demographic, socioeconomic, and lifestyle behavior characteristics stratified for 3 age groups by sex. The mean BMI was significantly higher among middle-aged men ($P=.03$). The young adult groups of both sexes had substantially higher education than the middle and old age groups at $P<.001$ among men and $P=.007$ among women. Household income was significantly higher among middle-aged women ($P=.001$). In addition, the old age group among men had significantly higher unemployment than other age groups ($P=.041$).

Regarding lifestyle behavior, young men who smoked or drank alcohol more than 1 day a week was significantly higher than for middle and old age men ($P=.032$). Young men also had significantly more moderate or vigorous exercise than middle and old age men ($P=.02$). Women showed no significant differences in lifestyle behaviors by age group.

Nutrition Status by Age Group

Table 3 shows the results of the eating frequency for each item from the results of FDSK by age group.

Consumption of the food groups which were eaten by over 50% of the participants more than 3 days a week for the young age group were dairy, fruit, grain, meat; for the middle age group, fish, grain, potatoes and vegetables; and for the old age group, fish, grain, potatoes, and vegetables.

The results showed that the young age group had significantly higher consumption of dairy food ($P<.001$), meat ($P<.001$), nuts ($P=.042$), and seaweed ($P<.001$) than the middle and old age groups. The young age group also had significantly lower consumption of fish ($P=.004$), potatoes ($P=.01$), and vegetables ($P<.001$) than the middle and old age groups. There was no difference in grain consumption across groups.

Table 1. Socio-demographic and Health Characteristics of Study Participants

	Total		Men		Women		P value ^d
	n	Mean %	n	Mean %	n	Mean %	
Age in years (mean \pm SD ^a)	176	41.3 (13.4)	75	43.4 (15.4)	101	39.7 (11.6)	.07
BMI ^b (mean \pm SD)	176	30.3 (5.7)	75	28.5 (4.8)	101	31.7 (6.0)	<.001
Weight classification (%)							
Normal weight (BMI < 25)	31	18	18	24	13	13	.006
Overweight (25 ≤ BMI < 30)	60	34	31	41	29	29	
Obese (BMI ≥ 30)	85	48	26	35	59	58	
Educational achievement (%)							
Low education (No schooling or Primary school)	92	52	32	43	60	59	.033
High education (Secondary school or higher)	84	48	43	57	41	41	
Occupation (%)							
Unemployed	68	39	15	20	53	53	<.001
Employee	81	46	49	65	32	32	
Employer	27	15	11	15	16	16	
Household income (%)^c							
Low (Income < 1000)	47	27	19	25	28	28	.93
Middle (1000 ≤ Income < 3000)	100	57	43	57	57	56	
High (Income ≥ 3000)	29	17	13	17	16	16	
Marital status (%)							
Married	151	86	67	89	84	83	.28
Never married/Divorced/Widowed	25	14	8	11	17	17	

^a SD = standard deviation; ^b BMI = body mass index; ^c Income = Solomon Islands dollar/2 weeks; ^d P values were calculated using the Chi-squared test and Student's t-test.

Table 2. Socio-demographic Characteristics, Health Characteristics and Lifestyle Behaviors by Sex and Age Group

	Men								Women									
	Total		Young age (20-39 years)		Middle age (40-59 years)		Old age (60 and over)		<i>P</i> value ^a	Total		Young age (20-39 years)		Middle age (40-59 years)		<i>P</i> value ^d		
	n	Mean %	n	Mean %	n	Mean %	n	Mean %		n	Mean %	n	Mean %	n	Mean %	n	Mean %	
Weight Status																		
BMI ^a (mean±SD ^b)	75	28.5 (4.8)	33	27.1 (4.4)	26	30.4 (4.9)	16	28.5 (4.3)	.032	101	31.7 (6.0)	50	30.8 (5.7)	45	32.4 (6.1)	6	32.6 (8.3)	.41
Weight classification (%)																		
Normal weight (BMI<25)	18	24	11	33	3	12	4	25	.006	13	13	8	16	4	9	1	17	.79
Overweight(25≤BMI<30)	31	41	18	55	9	35	4	25		29	29	15	30	13	29	1	17	
Obese (BMI≥30)	26	35	4	12	14	54	8	50		59	58	27	54	28	62	4	67	
Demographic characteristics																		
Age in years (mean±SD)	75	43.4 (15.4)	33	29.5 (5.1)	26	46.3 (4.4)	16	67.3 (6.0)	.006	101	39.7 (11.6)	50	29.9 (5.8)	45	47.6 (5.1)	6	62.0 (2.8)	<.001
Socio-economic Status																		
Marital status (%)																		
Married	67	89	26	79	25	96	16	100	.031	84	83	41	82	38	84	5	83	.95
Never married/Divorced/ Widowed	8	11	7	21	1	4	0	0		17	17	9	18	7	16	1	17	
Educational achievement (%)																		
Low education(Noschool- ing or Primary school)	32	43	8	24	10	39	14	88	<.001	60	59	22	44	33	73	5	83	.007
High education (Second- ary school or higher)	43	57	25	76	16	62	2	13		41	41	28	56	12	27	1	17	
Occupation (%)																		
Unemployed	15	20	4	12	4	15	7	44	.041	53	53	29	58	38	84	5	83	.08
Employee	49	65	24	73	16	62	9	56		32	32	10	20	5	11	1	17	
Employer	11	15	5	15	6	23	0	0		16	16	11	22	2	4	0	0	
Household income (%)^c																		
Low (Income < 1000)	19	25	9	27	5	19	5	31	.90	28	28	9	18	14	31	5	83	.001
Middle (1000 ≤ Income <3000)	43	57	18	55	16	62	9	56		57	56	36	72	20	44	1	17	
High (Income ≥ 3000)	13	17	6	18	5	19	2	13		16	16	5	10	11	24	0	0	
Lifestyle Behavior																		
Alcohol frequency (%)																		
Never	42	57	12	38	14	54	16	100	.002	79	79	34	68	40	89	5	100	.24
1-2 days/week	26	35	18	56	8	31	0	0		15	15	12	24	3	7	0	0	
3-4 days/week	4	5	1	3	3	12	0	0		3	3	2	4	1	2	0	0	
5-6 days/week	2	2	1	3	1	4	0	0		3	3	2	4	1	2	0	0	
7 days/week	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	
Exercise behavior (%)																		
Sedentary or light physical activities/week	62	83	23	70	23	89	16	100	.020	97	97	47	94	45	100	5	100	.21
Moderate or vigorous physical activities/week	13	17	10	30	3	12	0	0		3	3	3	6	0	0	0	0	
Smoking behavior (%)																		
Never	58	77	22	67	21	81	15	94	.032	95	95	47	94	44	98	4	80	.06
1-2 days/day	12	16	10	30	2	8	0	0		2	2	2	4	0	0	0	0	
3-4 days/week	0	0	0	0	0	0	0	0		1	1	1	2	0	0	0	0	
5-6 days/week	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	
7 days/week	5	7	1	3	3	12	1	6		2	2	0	0	1	2	1	20	

^a BMI = body mass index; ^b SD = standard deviation; ^c Income = Solomon Islands dollar/2 weeks; ^d P values were calculated using the Chi-squared test and Student's t-test.

Table 3. Eating Frequency of Each Food Item from based on the Food Diversity Score Kyoto Survey

	Total		Young age (20-39 years)		Middle age (40-59 years)		Old age (60 and over)		
	n	%	n	%	n	%	n	%	P value ^b
Food items^a									
Beans	Hardly eat	56	32	27	33	22	31	7	33
	Sometimes	94	54	42	51	39	55	13	62
	Often	16	9	9	11	7	10	0	0
	Everyday	9	5	5	6	3	4	1	5
Dairy	Hardly eat	78	45	21	25	39	55	18	86
	Sometimes	22	13	12	15	9	13	1	5
	Often	21	12	13	16	7	10	1	5
	Everyday	54	31	37	45	16	23	1	5
Egg	Hardly eat	131	75	57	69	54	76	20	95
	Sometimes	33	19	17	21	15	21	1	5
	Often	4	2	3	4	1	1	0	0
	Everyday	7	4	6	7	1	1	0	0
Fish	Hardly eat	59	34	35	42	20	28	4	19
	Sometimes	46	26	26	31	14	20	6	29
	Often	29	17	11	13	11	16	7	33
	Everyday	41	23	11	13	26	37	4	19
Fruits	Hardly eat	20	12	9	12	9	14	2	10
	Sometimes	65	40	25	33	25	38	15	71
	Often	25	15	14	19	9	14	2	10
	Everyday	52	32	27	36	23	35	2	10
Grain	Hardly eat	8	5	3	4	4	6	1	5
	Sometimes	35	20	16	19	17	24	2	10
	Often	56	32	28	34	21	30	7	33
	Everyday	76	43	36	43	29	41	11	52
Meat	Hardly eat	73	42	20	24	34	48	19	91
	Sometimes	32	18	15	18	15	21	2	10
	Often	22	13	17	21	5	7	0	0
	Everyday	48	27	31	37	17	24	0	0
Nuts	Hardly eat	56	32	20	24	24	34	12	57
	Sometimes	82	47	39	47	34	48	9	43
	Often	15	9	10	12	5	7	0	0
	Everyday	22	13	14	17	8	11	0	0
Potato	Hardly eat	44	25	28	34	14	20	2	10
	Sometimes	53	30	30	36	18	25	5	24
	Often	31	18	11	13	13	18	7	33
	Everyday	47	27	14	17	26	37	7	33
Seaweed	Hardly eat	112	64	39	47	54	76	19	91
	Sometimes	52	30	37	45	13	18	2	10
	Often	8	5	4	5	4	6	0	0
	Everyday	3	2	3	4	0	0	0	0
Vegetables	Hardly eat	75	43	49	59	25	35	1	5
	Sometimes	19	11	11	13	6	9	2	10
	Often	23	13	8	10	8	11	7	33
	Everyday	58	33	15	18	32	45	11	52

^a Hardly eat (0 day/week), Sometimes(1-2 days/week), Often(3-4 days/week), Everyday(6-7days/week); ^b P values were calculated using the Fisher's exact test.

Table 4. Multiple Linear Regression Analysis with Body Mass Index by Age Group

	Young age (20-39 years)	P value	Middle age (40-59 years)	P value	Old age (60 and over)	P value
	$\beta(\text{SE})^a$		$\beta(\text{SE})$		$\beta(\text{SE})$	
Sex (Men=0, Women=1)	4.0(1.3)	.003	2.0(1.5)	.17	6.1(3.6)	.32
Marriage status (Married=0, Not married=1)	-4(1.4)	.006	-0.4(2.1)	.87	-3.6(7.0)	.67
Education (Low education=0, High education=1)	0.3(1.3)	.90	0.6(1.6)	.72	2.8(3.9)	.07
Household income						
(Low=0, Middle=1, High=0)	3.2(1.9)	.019	2.9(1.7)	.09	1.1(3.0)	.44
(Low=0, Middle=0, High=1)	4.4(1.9)	.023	7.5(1.9)	<.001	5.8(5.0)	.14
Occupation						
(Unemployed=0, Employee=1, Employer=0)	1.2(1.5)	.96	-0.8(1.5)	.73	1.4(2.8)	.06
(Unemployed=0, Employee=0, Employer=1)	1.3(1.6)	.46	-1.5(2.2)	.49	-	-
Smoking behavior (Never=0, Yes=1)	-1.1(1.7)	.50	1.8(2.4)	.46	8.7(6.4)	.19
Alcohol behavior (Never=0, Yes=1)	-0.9(1.2)	.46	-3.2(1.2)	.08	-	-
Exercise behavior (Sedentary or light=0, Moderate or vigorous=1)	0.9(1.7)	.59	0.3(3.4)	.93	-	-
Adjusted R ²	0.2		0.2		-0.02	

^a $\beta(\text{SE})$ presented separately for age group.

Association Between Factors for Higher BMI

Table 4 shows the results of multiple regression analysis broken down by age group. It was found that in the young adult group, being female ($P=.003$), being married ($P=.006$), and being at a middle-income level or higher ($P=.019$ among middle income and $P=.023$ among high income) were all significantly associated with higher BMI. In the middle age group, the highest income level ($P<.001$) was significantly associated with higher BMI. On the other hand, there was no significant factor regarding higher BMI in the old age group. Regarding lifestyle behavior factors, there was no significant factor regarding higher BMI in any age group. Scatter plots showed the linearity, and the residuals were normally distributed. Variance inflation factors of all variables were less than 2, so multicollinearity was absent.

Discussion

Demographic Factors

While a previous study conducted countrywide found 16% of men and 25% of women were obese, the current study focused on the capital city and found a higher prevalence of obesity among men and women at 35% and 58%, respectively.¹ The difference in obesity prevalence is possibly due to an effect in the different study area. The previous study targeted all areas, including the capital. The obesity prevalence in other provinces is lower than in the capital city. Alternatively, this study focused

on only people living in the capital city, which is urban, more economically developed, and exhibits a higher prevalence of obesity than other parts of the country. Urbanization is known to be one of the factors that cause significant changes in diet and activity patterns.²² A previous study indicated that PICs are rapidly becoming more urban as people move to cities to escape rural poverty and get better health and education services.²³ Urbanization includes an increased intake of fat, sugar, and refined carbohydrates.²⁴

The present study found women had significantly higher BMI than men. This is consistent with previous findings in the Solomon Islands and other developing countries.^{1,16,25-27} One possible reason for a higher prevalence of obesity in women may be found in marital status. According to our multiple regression analysis, being a woman and being married is related to obesity only in the young adult age group. There was no relation shown in the middle and old age groups.

A previous study in the United States found the reason BMI increased during marriage was due to the social obligations of marriage, indicating couples tend to have regular meals and eat heavier, denser food.²⁸ Birth-giving might also contribute the higher prevalence of obesity among women. According to another study, pregnancy was a factor in gaining bodyweight.^{29,30} Solomon Islands has a high fertility rate with more than 4 children per woman.³¹ This suggests that being pregnant may be a trigger to gain body weight among young women.

Food Intake Situation by Gender and Age

There was no difference in grain consumption across groups. A previous study found that rice is chosen as the most frequent staple food in the Solomon Islands because of its price, shelf life, and ease of preparation.³² The present study also showed a nutrition transition from traditional staples like potatoes to imported rice, bread, and noodles, and this has occurred across all age groups in this urban setting.

This study found that traditional foods such as fish, vegetables, and potatoes have been supplemented by animal protein, dairy, and rice, especially among young adults. Previous studies in the Pacific indicated a relationship between age and food preferences, with younger people generally preferring to eat imported processed foods and older people generally preferring local foods.³³ In a recent study, the dietary analysis indicated that urban residents in the Solomon Islands consumed more refined grains and processed fish and meats due to the adoption of a western lifestyle than those still living the traditional lifestyle of the Solomon Islands.^{7,16,25} The present study did not look at how much processed food the young age group consumed, though it did find that they consumed fewer vegetables and potatoes, which contribute fiber and micronutrients to the diet than the middle and old age groups.

A previous study in the Solomon Islands found that consumption of less green leafy vegetables is related to obesity.⁷ The prevalence of obesity is forecasted to increase if young adults continue to pursue a “western” lifestyle.

Socioeconomic Factors for Obesity

In this study, SES was measured by occupation, household income, marital status, and education level. The study found that BMI was positively associated with income in both the young and middle adult groups. This finding was consistent with other studies. A previous study found that SES, such as income and property, was positively related to body weight in developing countries.³⁴ Conversely, it was just the opposite in developed countries.³⁴ Some studies suggest the reason SES has now become positively associated with obesity in developing countries; a study conducted in Tonga showed that those with higher SES found greater availability of imported foods such as processed foods and fatty imported meats.³⁵ A previous study conducted in the Solomon Islands found when there is money available, people buy rice and other imported processed food.³⁶ In the Solomon Islands, increased economic resources might allow people to buy and eat higher-calorie processed foods, which contribute to weight gain.

Limitations

There were several limitations to this study. First, it is a cross-sectional study, which can lead to limited conclusions given that the causation between SES and obesity cannot be determined. Second, the small sample size might also affect the sample’s margin of error, which lowers its statistical power. Third, this study only looked at the factors of patients who came to the clinic. Thus, the sampling could be biased, and the study did not have a control group of people who do not go to a clinic.

Conclusion

The present study indicates a high prevalence of obesity in both sexes and found that women have significantly higher BMI than men across all age groups. Data from the present study showed that participants with more than a middle-income level and being married were significantly associated with higher BMI in young adults. In the middle age group, high-income level was significantly associated with higher BMI. In the Solomon Islands, higher SES individuals might consume higher-calorie foods, which contribute to weight gain. The findings strongly suggest that making an effective plan to develop health promotion programs for young people who have more than a middle-income level or are married is of paramount importance.

Conflicts of Interest

None of the authors identify a conflict of interest.

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An Analysis of Healthy Food Access Amongst Women in Peri-urban Honiara

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Abstract

Highly processed and energy-dense foods are contributing to the high and rising rates of non-communicable diseases and nutrient deficiencies in Solomon Islands. Non-communicable diseases currently cause 69% of deaths in Solomon Islands, and the rate is rising, fuelled in part by limited health system capacity to treat these conditions. Solomon Islands also has the highest reported undernourishment rate in the Pacific. Recent decades have seen several factors change the food and economic environment in Solomon Islands. Importantly, rural-to-urban migration has caused a disconnect between urban residents and access to land and home gardens. This study aimed to examine the complexities of nutritious food access in urban Solomon Islands. Data were collected from 32 women in Honiara, the islands' capital, using a novel survey instrument. There were 3 important findings: (1) the dominant influencers of the diet patterns described by participants in this study were food affordability and access to land on which to grow it, (2) all participants experienced food insecurity, and (3) reported diet patterns reflected unhealthy diets which were particularly high in processed and sugary foods. These findings suggest a need for improvements in the food environment in Honiara.

Keywords

diet, Pacific, Solomon Islands, nutrition transition, non-communicable disease, Pacific Island Countries and Territories

Abbreviations and Acronyms

NCD = Non-communicable disease

PICTs = Pacific Island Countries and Territories

Introduction

Non-communicable diseases (NCDs), including cardiovascular disease and diabetes, are the leading cause of death and disability in the Pacific region, imposing significant economic strain, pressure on overstretched health systems, and high levels of societal loss from premature deaths.^{1,2} Highly processed, energy-dense foods containing low amounts of micronutrients contribute to the high and rising rates of NCDs and nutrient deficiencies in Pacific Island Countries and Territories (PICTs), including Solomon Islands.^{1,3} Solomon Islands is an archipelago country in the Southwest Pacific with around 1000 islands, with an estimated population of 600 000.⁴ NCDs currently cause 69% of deaths in Solomon Islands, and the rate is rising. The problem is exacerbated by a limited health system capacity to treat these

diseases.⁵⁻⁷ Solomon Islands also has the highest reported total population undernourishment rate in the Pacific at almost 14%, rising 2% in the last decade.⁸ The country currently faces a triple burden of malnutrition: nearly 40% of adult women and children have anaemia, 33% of children have stunted physical growth, and more than half of adults are overweight or obese.⁹⁻¹²

Recent decades have seen a number of factors change the food and economic environment in Solomon Islands. Five years of civil unrest from 1998 to 2003, the global financial crisis, rapid population growth, natural disasters, and urbanization contribute to ongoing cultural and economic change.³ Solomon Islands ranks 152 of 189 countries in the Human Development Index.¹³ Approximately 80% of people in Solomon Islands live in rural areas and access food via subsistence agriculture^{14,15}; however, an annual urban population growth of 4.7% has caused a disconnect between urban residents and access to land and home gardens.¹⁵⁻¹⁷ Cash poverty is common in Solomon Islands, and food prices are high relative to monetary earnings.¹⁵

There is a significant lack of data on food and nutrition security in PICTs,¹⁸ including Solomon Islands. This lack of data is hampering efforts to build effective policies and regulatory frameworks to improve food systems.³ The present study was designed to provide policy-relevant insight to start to address this research gap. The study focuses on women because there is global evidence that autonomy of women is positively linked with their household's nutritional status.¹⁹ Women are more vulnerable to food insecurity than men, and the prevalence of obesity worldwide is 50% higher in women than in men.^{20,21} Between 1975 and 2014, increases in body mass index for women in PICTs were amongst the largest globally.²² Prevalence of overweight and obesity is higher in women in Solomon Islands than in men.⁷ Importantly, women in Solomon Islands experience strong inequalities in access to resources and control of household decision making within households.¹⁵

This study aimed to understand the nuanced complexities of nutritious food access in urban Solomon Islands by examining the following factors: (1) food security and patterns of consumption of key food groups and specific foods, and (2) the most important drivers of diet amongst participants to help inform targeted program and policy design.

Methods

Study Design

This study was informed by validated tools to collect data on food security and food consumption patterns.^{23,24} Data were collected using a structured questionnaire (see Appendix) starting with questions about demographic characteristics and general health indicator information. Food security was measured with an adapted Radimer/Cornell tool based on that used by Shoae et al.²³ This tool included a series of questions about household, individual, and child food insecurity, and participants were asked to answer “always,” “sometimes,” or “never” to each question. Diet patterns were assessed using a shortened version of a food frequency questionnaire used in a published study of 785 adults in Samoa.²⁴ The aim of this data collection was not to quantify exact dietary intake levels but to ascertain broad patterns of food consumption in our study participants to explore the reasons for such diet patterns. Participants were then asked a series of open-ended questions about their diet patterns, which explored drivers and barriers to consumption of a nutritious diet.

Data Collection

The study took place in Honiara, the capital of Solomon Islands. In-depth interviews were conducted with 32 women with children in their care attending local primary schools. Participants were recruited using convenience sampling, which was directed by school staff. Invited participants were given detailed information about the study in the form of a participant information sheet and verbal explanation. Informed consent forms were signed before each interview commenced. There were no withdrawals from the study. Participants were reimbursed with funds to purchase lunch and bus transport.

Participants were interviewed individually in a private room. Interviews were run and transcribed in English by trained members of the research team. Research assistants were also present and translated the questions and responses into and from Solomon Islands Pijin when required.

Data Analysis

Interview answers were entered into Microsoft Excel. Food frequency data were classified into energy foods (carbohydrate-based foods), protective foods (fruit and vegetables), and body building foods (foods high in protein) using the Pacific Guidelines for Healthy Living.²⁵ These guidelines further classify energy foods into the following categories: “energy foods to choose” (for example, root crops, whole grains), “energy foods to limit” (foods high in refined carbohydrate including white bread and white rice), and “energy foods to avoid” (foods high in fat, highly processed, high in sugar including sugar-sweetened beverages).²⁵ Food security questionnaire responses were used

to classify each participant as household, individual, or child food insecure.

The answers to the questions about food access and diet patterns were analyzed using thematic analysis to determine the most important reasons for dietary patterns.²⁶

The study was approved by Solomon Islands National Health Research and Ethics Committee.

Results

Study Demographics

The study participants (n=32) were all women living in suburbs and villages close to Honiara. Table 1 summarizes the key demographics of the study population. Of note, 71% of participants (n=22) were under the age of 40, and 81% of participants (n=26) cared for their families full time without a direct source of personal income. The average number of years lived in Honiara was 19, and the average household size was 5 adults and 3 children.

Food Consumption Patterns

Table 2 presents a summary of key food items in participants' reported diet patterns. The most commonly consumed food group was energy foods. Among energy foods, white rice was consumed the most, with 86% of participants (n=24) consuming this daily. The second most commonly consumed food group was body building food. Fish was the most commonly consumed body building food; this food was consumed daily by 63% of participants (n=20). Less than a quarter (23%) of participants (n=7) reported consuming fruit daily, and 57% of participants reported consuming vegetables daily (n=17).

Cooking Style

Most participants cooked food in fresh coconut cream 3 or more times per week (data not shown). The main foods cooked in coconut were cabbage, fish, and starchy vegetables. Most participants cooked foods in oil at least weekly. The most common cooking oil mentioned was palm oil, and participants also used peanut and vegetable oil. The main foods cooked in oil were fish, cabbage, and chicken. Most participants also prepared foods in soups at least weekly. The main foods prepared as soups were starchy vegetables and chicken.

Reasons for Diet Patterns

Table 3 demonstrates that the most commonly mentioned reason for selecting particular types of food for consumption was affordability (84%, n=27). Other reasons given were availability of processed food (44%, n=14), availability of land (47%, n=15), taste (28%, n=9), pursuit of health (19%, n=6), and culture

(9%, n=3). When participants explained these reasons, some specific foods were mentioned as illustrative examples. For example, tinned fish was mentioned in relation to affordability. White bread, white rice, and tea with sugar were mentioned in relation to affordability and convenience. Participants noted noodles were easy to prepare. In addition, Table 3 shows that 63% of participants (n=20) reported that the cooking facilities available to them influenced the foods they were able to cook. Participants were not directly asked which cooking facilities they used, so it was impossible to quantify the most common cooking facilities used. Still, participants mentioned using firewood, gas stoves, and earth ovens.

As shown in Table 3, all participants who responded to the question of whether their diets were different from those eaten by their grandparents when they were the same age stated they were (n=31, 100% of responses). Participant responses described a shift away from diets high in fresh fruit and vegetables and wild-caught meat eaten in previous generations and towards diets high in energy-dense processed and convenience foods.

When participants were asked who in their household decides how much money was spent on food (Table 4), 55% of participants reported a joint decision (n=17, 15 of which was made jointly with the husband). Further, 23% (n=7) reported not being involved in the decision. Among those who reported not being involved in the decision, the participant's husband was the person most frequently mentioned to be responsible for this decision (n=7). Overall, 19% of participants (n=6) reported being solely responsible for the decision.

Food Security

All participants (n=32, 100%) reported experiencing food insecurity in their household (Table 5). The majority (n=29, 91%) also reported individual food insecurity, and 24 (75%) reported child food insecurity.

Table 1. Study Participant Demographics (N=32)

	n (%)	n (%)	n (%)	n (%)
Age (years)	20 to 29	30 to 39	40 to 49	No Response
	5 (16)	17 (55)	9 (29)	
Average Household Size	Adults		Children	
	5		3	0
Occupation	Care for family	Teacher	Retail	Other
	26 (81)	2 (6)	2 (6)	2 (6)
Education	Primary school	High school	University	No Response
	14 (50)	11 (39)	3 (11)	4
Province of Origin	Guadalcanal	Malaita	Other	No Response
	6 (19)	23 (72)	3 (9)	0
Average Number Years Lived in Honiara	19			5

Table 2. Reported Frequency of Consumption of Commonly Consumed Foods (N=32)

Food Item	Daily n (%)	3 Times Per Week n (%)	Once Per week n (%)	Less Frequently Than Once Per Week n (%)	No Response
Energy Foods					
White rice	24 (86)	2 (7)	2 (7)	0 (0)	4
White bread	19 (61)	5 (16)	7 (23)	0 (0)	1
Cassava	14 (45)	6 (19)	11 (35)	0 (0)	1
Energy foods to limit (eg, doughnuts, pancakes)	17 (53)	7 (22)	7 (22)	1 (3)	0
Sugar sweetened hot beverages	19 (63)	1 (3)	6 (20)	4 (13)	2
Body Building Foods					
Fish	20 (63)	6 (19)	5 (16)	1 (3)	0
Chicken	3 (10)	5 (16)	9 (29)	14 (45)	1
Protective Foods					
Fruit	7 (23)	10 (32)	11 (35)	3 (10)	1
Vegetables	17 (57)	8 (27)	4 (13)	1 (3)	2

Table 3. Key Drivers of Diet Patterns (N=32)

Driver/s of Diet Patterns	Participants Who Describe Driver as Significant n (%)	Example Quotation
Affordability	27 (84)	We grow our own local sweet potatoes which doesn't cost any money (23 year old participant)
Availability of land on which to grow food	15 (47)	If I had good soil to grow my own fruits, root crops, and vegetables, I would eat healthy (44 year old participant)
Availability of processed food	14 (44)	[my grandparents] depended on food from garden. Today, we live on money and depend on processed food from the shop (34 year old participant)
Type of cooking facilities available, ease of preparation	20 (63)	Yes [the cooking facilities available to me influence the type of food I prepare], because we only use fire so I tend to boil, fry, and stew our food (33 year old participant)
Perceived healthiness	6 (19)	Because it is a healthy meal and it is available at home (35 year old participant)
Taste	9 (28)	[I consume soda because] it tastes good and is cold (43 year old participant)
Culture	3 (9)	Affordability, culture, and availability [have the strongest influence on my diet patterns] (33 year old participant)
Comparison of Diet with Grandparents' Diet	n (%)	No response
Participant diet different from those of grandparents	31 (100)	1

Table 4. Household Decision Making Status (N=32)

	n (%)	No response
Participant Only	6 (19)	1
Joint Decision Of those with joint decision (N=17), decision made with husband	17 (55) 15 (88)	1 0
Someone Else Of those with decision made by someone else (N=7), decision made by husband	7 (23) 7 (100)	1 0

Table 5. Food Security Status of Participants (N=32)

Food Security Status	n (%)	No response
Household food insecure^a Of participants who were household food insecure (N=32), participant has been concerned household food will run out (Appendix Section 8: Q1)	32 (100) 28 (88)	0 0
Individual adult food insecure^b Of participants who were individual food insecure (N=29), participant sometimes does not eat for whole days at a time (Appendix Section 8: Q10)	29 (91) 13 (45)	0 0
Child food insecure^c Of participants who were child food insecure (N=24), participant's children sometimes don't eat for a whole day (Appendix Section 8: Q15)	24 (75) 6 (25)	0 0

^a Household food secure: Answered 'sometimes true' or 'always true' to one or more question related to household food insecurity (Questions [Q] 1–6 in Appendix Section 8).

^b Individual adult food insecure: Answered 'sometimes true' or 'often true' in one or more adult-level items (Q7 –Q10 in Appendix Section 8).

^c Child food insecure: Answered 'sometimes true' or 'often true' in one or more child-level items (Q11–Q15 in Appendix Section 8).

Discussion

Summary of Results and Likely Implications

Our study aimed to provide policy-relevant insights about access to a nutritious diet in contemporary Honiara in light of the current triple burden of malnutrition and the rapid changes to the urban population size and economy.^{9,16} This was a methodologically novel study in Solomon Islands and the results provide useful information on the under-researched area of food insecurity and diet behaviour in Solomon Islands and other PICTs. The 3 most important findings were: (1) the dominant influencers of the diet patterns described by participants in this study were food affordability and access to land on which to grow fruit and vegetables; (2) all participants experienced food insecurity, meaning they all at least sometimes experienced difficulty accessing nutritious food, and some regularly skipped their own, or their children's, meals; (3) reported diet patterns reflected unhealthy diets which were particularly high in processed and sugary energy foods. There were no obvious patterns between socio-demographic characteristics, food security status, and diet patterns observed in this small descriptive study.

These 3 key findings are deeply interconnected and suggest the study participants are living in a food environment that is not supportive of good health. The dominant story told by the study participants was that they did not have the cash to purchase adequate nutritious food for themselves and their households, nor access to the land to grow it and that because of these challenges with nutritious food access (otherwise defined as food security), they are consuming inexpensive foods which are energy-dense, often highly processed, and low in nutrients. These foods have been implicated as key to the high rates of NCDs and micronutrient deficiencies in the Pacific.^{1,3} There is evidence that in a food-insecure environment, consumption of energy-dense, highly processed foods is the main mechanism whereby food insecurity can lead to obesity.²⁷

The diet patterns reported in this small study are consistent with grey literature reports that people in Honiara generally purchase food with cash, and as heavily processed, often imported foods are usually less expensive, these are increasingly becoming the main feature of people's diets.^{3,7,17} The findings from this study reflect reports of a worsening food security situation throughout the Pacific region. Connell reported that food insecurity has increased in the region in recent decades—due to cost, convenience, and prestige, diets are high in imported and processed foods, especially rice.²⁸

The most frequently reported energy foods consumed by the study participants are classified as “energy foods to limit” and “energy foods to avoid” in the Pacific Guidelines²⁵: the most common of these were white bread, white rice, pancakes, and donuts. Of further concern is that the vast majority of participants

reported consuming sugar-sweetened beverages (usually sugar in tea) at least weekly, and almost two-thirds consumed this daily. Sugar-sweetened beverages are classified as energy food to avoid in the Pacific Guidelines for Healthy Living. There are several potential poor health consequences of consuming these “energy foods to limit” and “energy foods to avoid.” For example, consuming sugar-sweetened beverages increases the risk of diabetes.²⁹ It is notable that diabetes is now the leading cause of death and disability in Solomon Islands.³⁰

The diet patterns reported by participants in this study suggest that fruit and vegetable consumption is likely to be well below the 5 servings per day recommended in the Pacific Guidelines for Healthy Living.²⁵ The most recent STEPwise approach to surveillance, known as STEPS, survey showed that 93% of the Solomon Islands population ate less than 5 servings of fruit and vegetables per day; the average daily consumption was 0.8 servings of fruit and 1.3 servings of vegetables.³¹ There is evidence from Solomon Islands that households in urban areas and those with low incomes are vulnerable to insufficient fruit and non-starchy vegetable consumption.³²

In Solomon Islands society, food and land are owned collectively – people are socially required to share food and housing with their extended kin, or *Wantok*.⁷ This has implications for the way resources are distributed and preparing high-volume, low-cost meals often mean low-nutrient, high-volume foods like rice are sought.⁷ The participants in this study were generally from large households. Although a pattern between household size and diet patterns was not observed in this small descriptive study, recent research from Solomon Islands found that those living in households with 7 or more people acquired less fruit and non-starchy vegetables than those in small households.³²

The relationship between inter-household sharing of resources, poverty, and food security was not explored in this study but warrants attention in future research. It has been suggested that remittance funds sent to the rural population by their *Wantok* in Honiara are decreasing due to decreased food affordability in Honiara¹⁷, which demonstrates that urban welfare is connected with national development.¹⁶

Strengths and Limitations

This study was designed to understand dietary patterns, food preferences, and interactions with food environments, not exact food intake levels. The food frequency questionnaire results offer indicative descriptive figures only due to the small sample size and relied on self-reported diet information, which could have introduced bias. The question about vegetable consumption did not distinguish between starchy (an energy food) and non-starchy vegetables (protective foods). The survey was conducted in Honiara only, so may not be representative of all urban areas.

The survey was performed before the most recent Pacific Guidelines for Healthy Living were published,²⁵ so its recommendations about portions of energy, body building, and protective foods could not be built into the survey. However, these were used when analyzing the data, thus making the findings directly applicable to policy makers in the Pacific. The tool used to measure food security was designed based on the best available resources; however, there is no validated food security measurement tool for Solomon Islands.

The question about household decision-making in this study was simple, and as a result, the responses were likely more superficial than the lived reality for participants. Although most participants reported they had some say in household decision making around food purchasing, it should be noted that in Solomon Islands, “women are responsible for decisions about raising children, providing food, and running the household, but men have the power to beat them if they get it wrong.”¹⁵ More time and attention should be given to this vital but highly sensitive topic in the future.

Recommendations

The findings of this study call for urgent action in improving access to a nutritious and affordable diet in urban Solomon Islands. As the combination of rural-urban migration, lack of access to garden land, low incomes, and high formal unemployment in urban populations is a serious problem in many PICTs,^{3,33} the methods and findings from this study have value across the region. The methodology used in this study may have use as a foundation in gathering further baseline and subsequent progress information, where food systems interventions and policy changes are implemented.

The combined findings of high food insecurity and diets high in processed foods match those of other studies from the Pacific. Connell declared that food insecurity in PICTs is “an increasingly urban problem,” with the solution embedded in broad economic growth and poverty reduction,²⁸ and cross-sectoral action not limited to the agriculture or health sectors. The issue of urban food poverty in Solomon Islands will affect more and more people as urbanization continues to grow. The rise in urban population size—at a rate of 4.7% per year, faster than the national growth rate of 2.3%—means that poverty reduction and provision of basic services are in need of urgent attention by the national government.¹⁶

A 2018 review spanning 172 countries has shown that imports of processed food and sugar significantly increase average body mass index.³⁴ The promotion of healthier food imports through consideration of nutrition in trade policy design and input of the health sector in trade policy has strong potential to improve diets in the Pacific region.^{35,36}

Increased alignment between local agriculture and nutrition and health outcomes is needed at high priority.³ Policies that provide support for marketplaces to sell fresh local foods at affordable prices relative to other foods on the market; and to facilitate different cooking options for households can increase nutritious food consumption. The findings from this study add to the small amount of existing evidence from Melanesian countries that financial and physical access to nutritious food is an important barrier to its consumption.^{7,32,37} There is the potential to trial programs that have worked in other countries to address these issues. For instance, research from a low-income area of the United States has shown that an intervention where mobile markets sell fruit and vegetables, combined with an education program, significantly increased consumption of fruit and vegetables.³⁸

Conflict of Interest

None of the authors identify a conflict of interest.

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Appendix: Survey Instrument

Understanding the socio-demographic determinants of access to healthy food
 SURVEY INSTRUMENT FOR INDIVIDUAL INTERVIEWS
 CONFIDENTIAL

Interviewer name

Date

School at which interview conducted

Participant ID

1. Participant consent

1.01 Information sheet given and verbally explained

1.02 Consent form given and signed?

2. Introduction

Thank you for agreeing to participate in this survey. We are Penny Farrell and ... and ... from The University of Sydney in Australia.

We will ask a series of questions about your diet and the interview will go for around an hour.

Your participation is confidential and will not be linked to your child in any way. We will not share the answers with anyone including your child's school.

You can interrupt the interview at any point to ask questions, voice concerns or end the interview if you wish.

There are contact details for our research team on the participant information sheet which is yours to keep.

3. General information about participant

3.01 Age (in years, as at last birthday):

3.02 Sex:

3.03 Village & district live in: Village: District:

3.04 Could you tell me the final class you graduated from at school or in your education? Circle one of: Did not finish primary school, finished primary school, finished high school, has university degree)

3.05 Please briefly explain what you do (e.g. study, type of employment, unemployed, care for family at home)

3.06 Number of adults including yourself (18 and over) in household

3.07 Number of children (18 and under) in household

3.08 Did you grow up in Honiara, if not where did you live as a child?

3.09 How long have you been living in Honiara?

3.10 Do you mainly live in Honiara?

4. Food frequency questionnaire

We will now work through a list of food items and ask how often (never, <1/month, few times a month, 1/week, 2-4/week, 1/day, 2-3/day, >4/day) you consume one serve of each item. [Refer to printed card]

How often do you eat one serve of:

MEAT

Beef in soy sauce, Beef curry, Tinned Corned beef, Salt beef, BBQ chicken, Fried chicken, Chicken curry with coconut cream, Chicken in soy sauce, Baked chicken, Roasted pork (if Y, what cut – or do you eat the whole pig?), Pork baked in earth oven (if Y, what cut – or do you eat the whole pig?), Fried fish, Boiled fish in coconut cream, Tinned fish, Fish prepared in any other ways – how often, Other seafood (ask to list), BBQ lamb chop, Mutton in any other form (if yes, what cut and how is it prepared?), BBQ sausage, Other meat (if yes, what cut and how is it prepared?)

STAPLE/ENERGY

Taro, Potato, Sweet potato, White bread, Wholemeal bread, Cassava, White rice, Green/cooking banana; If yes, how is it prepared, Coco yam, Yam, Cereal; If any, what type, Breadfruit

FRUIT & VEG

How often do you eat 1 serve of fruit? [reiterate serve: half a pawpaw or whole guava, eating banana], How often do you eat 1 serve of vegetables? [reiterate serve: fistful]

DRINKS

Fruit juice (packaged), Fruit juice (fresh), Cordial drink e.g. Tang e.g. raro or sprim, Soda can, Tea or coffee WITH milk, Tea or coffee WITH sugar, Young drinking coconut, Milo, 3 in 1 coffee sachets

SNACKS/TREATS

Lollies, Ice cream, Nuts (e.g. peanuts), Fried snacks, Pizza, Beef burger, Meat pie, Packaged potato chips, Twisties, Hot potato chips, Instant dried noodle, Pancakes, Donuts, Cake, Cream biscuits, Cabin crackers, Sausage roll, Cream bun, Coconut bun

5. Summary of commonly eaten foods

5.01 With the most commonly eaten item in each of the 5 categories in the previous question, why do you eat them – what influences your food choices (if need prompting, rank the most important reasons (affordability, availability, advertising, taste, convenience, habit, healthiness, or culture) for eating these foods?

5.02 [Show flip card off food pyramid.] This is the guideline for the healthy amounts of each food type you should eat. What would help you to eat your meals in these proportions?

5.03 Do you think your overall diet is different to what your grandparents ate when they were your age? Why?

6. Ways of preparing food

6.01 Which main type of cooking oil do you use and why?

6.02 How often do you cook with coconut?

6.03 Which are the main foods you cook in coconut?

6.04 How often do you fry foods in oil?

6.05 Which are the main foods you cook in oil?

6.06 How often do you prepare (or eat) soup?

6.07 Which are the main foods you prepare in soups?

6.08 List the type of cooking equipment you have at home: (E.g. open fire, small gas burner, oven etc. Do the cooking facilities in your home influence the food you cook?) How?

7. Food consumption and living situation

7.01 During a typical week day, what do you eat, and where do you get it from? Why do you choose this food? For example, in the morning after you wake up and before you leave home, what do you eat and why? [Continue to prompt until participant has explained source of all foods typically eaten in a day – will ask this open-ended question via interpreter]

7.02 What is their role in food purchasing in their household?

7.03 Who decides how money is spent on food in your household? (Participant, joint decision [with whom]) or someone else's decision [who])

7.04 What is your household income, including remittances? What proportion of your household income is from remittances?

7.05 What is your personal income?

7.06 Can you estimate how much money you spend on food each week for yourself?

7.07 Can you estimate how much money you spend on food each week for your family?

7.08 Can you describe what is a healthy meal?

7.09 Can you list ways to make a meal healthier and balanced?

7.10 Please point to the body shape you think looks attractive for men [Show flash card]

7.11 Please point to the body shape you think looks most attractive for women [Show flash card]

7.12 Please point to the body shape you think looks most healthy for men [Show flash card]

7.13 Repeat for most healthy for men and most healthy for women [Show flash card]

8. Food security

Participants will be asked to answer the following questions in relation to the past 12 months: (Remind of confidentiality)

Household questions	Often true/Sometimes true/Not true
1. I have been worried that our food will run out	
2. I have been thinking that I wish I had more money and I could buy more food	
3. When I want to make a meal, the materials needed for making it have run out and it's hard for me to get more	
4. I can't prepare meals that I think are healthy for my family, because the materials needed to make it have run out, and I don't have money to buy them again	

5. We eat the same food for several days in a row, because we don't have enough money to buy different kinds of food	
6. I only prepare a few kinds of cheap food and can't make different food because I don't have enough money	
Individual adult items – how often are these true for you?	
7. How often are these true for you:	
(a) I have one meal per day	
(b) I have 2 meals per day	
(c) I have 3 meals per day	
8. I can't eat nutritious food because I don't have money to buy it	
9. Due to lack of money and enough food, I only eat bread, rice or noodles	
10. Sometimes I don't eat all day	
Individual child items how often are these true for the children in your care?	
11. I can't feed my child/children nutritious food because I don't have enough money	
12. Sometimes my child/children only have bread or rice because I don't have money to buy more of other foods	
13. I know that my child/children sometimes is/are hungry but I don't have money to buy more food	
14. My child/children have their meal sizes cut because I don't have enough money to buy food	
15. Sometimes my child/children don't eat all day	

Household secure: Answered 'not true' to all questions

Household insecure: Answered 'sometimes true' or 'always true' to one or more question related to household food insecurity (Q1–Q6).

Individual adult insecure: Answered 'sometimes true' or 'often true' in one or more adult-level items (Q7–Q10).

Child food insecure: answered 'sometimes true' or 'often true' in one or more child-level items (Q11–Q15).

Adapted from Shoae et al. 2007: Is the adapted Radimer/Cornell questionnaire valid to measure food insecurity of urban households in Tehran, Iran?; Public Health Nutrition: 10(8), 855–861; and Derrickson et al. The core food security module scale measure is valid and reliable when used with Asians and Pacific Islanders; The Journal of Nutrition; Nov 2000; 130, 11.

9. Health information

9.01 How frequently do you do exercise where your heart rate is fast for 30 minutes or more? ___ < 1 X a week, ___ 1-3 X a week, ___ >3 X a week

9.02 Are you pregnant? If pregnant, how many months (number of completed months if known)

9.03 Have you ever been diagnosed with diabetes? (Y/N)

9.04 Have you ever been diagnosed with heart disease or high blood pressure? (Y/N)

9.05 Alcohol consumption (Y/N)

9.06 If Y: How many times a week do you drink, how many drinks do you have on average when you drink? how many drinks per week on average (1-3; 4-7; 8+)

9.07 Do you smoke? (Y/N)

INSIGHTS IN PUBLIC HEALTH

Interdisciplinary Student Team from University of Hawai‘i at Mānoa in the HI-EMA Community Care Unit: Identifying Needs in the Pandemic and Learning Together

Sydney Unciano BS; Angel Lynn Talana BS; Fary Maldonado MPA; Kira Oyama RN, MSN; Chelsea Emma Apo RN; Kristine Qureshi PhD,RN,CEN,PHNA-BC,FAAN; Lee Buenconsejo-Lum MD, FAAFP; Rachel Burrage MSW,PhD; Robin Arndt MSW,LSW; and Tetine Sentell PhD

Insights in Public Health is a monthly solicited column from the public health community and is coordinated by HJH&SW Contributing Editor Tetine L. Sentell PhD from the Office of Public Health Studies at the University of Hawai‘i at Mānoa and Contributing Editor Michele N. Nakata JD from the Hawai‘i Department of Health.

Introduction

The COVID-19 pandemic demands new, interdisciplinary collaborations to respond to the crisis and prepare for a transformed future.^{1,2} For students in health and social sciences, this presents not only high demands and new stressors, but also many learning opportunities.³⁻⁶ This article describes the experience of the Interdisciplinary Student Team from the University of Hawai‘i at Mānoa (UH Mānoa) who responded as part of the Hawai‘i Emergency Management Agency (HI-EMA) Community Care Team in summer 2020.

HI-EMA is the emergency management agency for the state of Hawai‘i.⁷ The HI-EMA Emergency Support Function 8 (ESF-8) focuses on public health and medical services in the response. To respond adequately to the breadth and scope of impacts related to the COVID-19 pandemic, the HI-EMA COVID-19 ESF 8 Team was expanded in April 2020. One unit established under ESF-8 was Community Care and Outreach (CCO), which has a key goal to identify vulnerable populations and articulate their social needs.

The ESF-8 CCO unit includes: a multidisciplinary team of faculty from UH Mānoa in nursing, medicine, social work and public health who are ESF-8 CCO unit members; a community advisory core representing key perspectives; and data analytics support. A total of 5 students from graduate programs in social work, public health and nursing volunteered to support the CCO unit as the Interdisciplinary Student Team during the 2020 summer. Specifically, the Interdisciplinary Student Team participants were Fary Maldonado (social work), Kira Oyama (nursing), Angel Lynn Talana (public health), Sydney Unciano (public health) and Chelsea Emma Apo (nursing). It is important to note that the Interdisciplinary Student Team does not claim to represent official views of HI-EMA.

These students share their insights, activities, and lessons from their urgent and important work to identify and understand community social needs arising from the COVID-19 pandemic. They describe key projects in which they were involved, provide their perspectives, including synthesized insights into the pandemic response, and finally consider how interdisciplinary learning may be contextualized in terms of the needs of communities in Hawai‘i now and in the future. There is hope that this work will provide inspiration, guidance, and information for other interdisciplinary student collaborations in Hawai‘i and beyond.

Activities

The Interdisciplinary Student Team accomplished 3 primary activities in summer 2020.

Organizational Survey

The ESF-8 CCO Unit was tasked with identifying capacity, needs, and threats to members of the community from the COVID-19 epidemic in Hawai‘i, as well as making recommendations to mitigate the situation. They first assessed the current capacity, needs, and threats to agencies that provide health and social services in support of the state’s vulnerable populations. Thus, a survey of community-based health and social service entities was conducted across the state in spring 2020.^{8,9} An executive summary was issued followed by a detailed report.^{9,10}

This survey included 26 questions, including agency/entity locations, services provided, and population served; the impact of COVID-19 on the population served; and organizational capacity and needs as a result of the COVID-19 outbreak in Hawai‘i. Several questions were open-ended, meaning respondents could type a detailed answer in text. The student team supported qualitative data analyses of these answers using

Dedoose (Version 8.0. 2018. Los Angeles, CA: SocioCultural Research Consultants, LLC),¹¹ a web-based application that can support thematic coding.

First, students looked for common themes across responses and flagged them with the software. Then, after a discussion to confirm unique themes and remove overlap, they performed a second round of refined thematic coding and identified illustrative quotes. They then used the software to quantify and categorize responses by theme. From this information, the students created the report draft, including describing data, giving perspectives, and finding quotes to illuminate identified themes. This supported the unit members, the advisory committee, and the data analysts in completing the final report. In this process, students were actively engaged in teamwork, exchanging experiences, opinions, and perspectives around social services from the perspective of the local entities in the time of COVID-19.

Public Engagement

After spending a great deal of time engaging with the qualitative analyses from the organizational survey, the student team had a strong sense of the diverse needs in Hawai‘i communities in response to the health, social, and economic consequences of the pandemic, especially from the organizational perspective. They then looked more closely at the quickly growing literature

and media reports around the impact of COVID-19 on various groups, including veterans, health care providers, Filipino communities, airline employees, and those with mental health conditions. After considering these groups in some detail, they synthesized needs around topics of interest to them, culminating in 2 op-eds published in Civil Beat, a local nonprofit news website. One was about the impact of the pandemic on Filipino communities in the state and was written by 2 students from these communities.¹² The second was from the perspective of health care providers and was written by 2 students providing care.¹³

Other Support

The students also learned about the background of emergency responses, including the HI-EMA structure, attended virtual unit meetings on Zoom, and helped pilot test a community-focused survey that was administered in August 2020.¹⁴

Students Perspectives

In this section, we share the specific learning experiences of our Interdisciplinary Student Team members (shown in Figure; Dr. Tetine Sentell of the UH Office of Public Health Studies, who coordinated the student team engagement in summer 2020, is also pictured).



Figure. From left to right, top to bottom: Tetine Sentell, Sydney Unciano, Kira Oyama, Chelsea Emma Apo, Angel Lynn Talana, and Fary Maldonado at a Zoom team meeting celebrating Kira Oyama's completion of her public health nursing master's degree.

Fary Maldonado

I am a PhD student at the UH Mānoa Myron B. Thompson School of Social Work with an interest in development of interventions for transitioning veterans as well as community-based research and cross-cultural issues. By participating in the project to identify community needs and concerns in the times of the COVID-19 pandemic, I enhanced the scope of my skills in community work and research. Being part of a project team allowed me to practice collaboration, challenge myself with new tasks, and experience interdisciplinary cooperation. Apart from improving my analytical and data collection skills, I succeeded in integrating my communication skills when discussing the possible issues related to COVID-19 health concerns with the team. Also, the contemplation on the scope of needs in Hawai‘i in the face of the pandemic enriched my professional experience.

The project was a good collaborative learning opportunity. The high values, ethics, and professionalism shown by each member of the team helped me grow and continue to develop my academic skills. The fact that we all come from different backgrounds and yet managed to engage in a very productive manner speaks volumes about the knowledge obtained from our programs. Faculty offered valuable mentorship and expertise. I benefited from observing the way tasks were conceived and accomplished. The knowledge and skills obtained from working on this project will be a valuable contribution to my future accomplishments.

Angel Lynn Talana

I am a Master of Public Health (MPH) student at UH Mānoa specializing in social and behavioral health sciences (SBHS). During these past few months, I had the opportunity to work on this project as part of my practicum and understand Hawai‘i’s community needs in light of the COVID-19 pandemic. This experience allowed me to garner valuable public health skills such as interdisciplinary teamwork, project building, data analysis, and health advocacy – important skills that I will undoubtedly use in future public health practice. By working with different disciplines such as nursing and social work, the project brought forth multiple perspectives of the pandemic and provided opportunity for meaningful discussions of how we can better serve our communities.

As an MPH SBHS student, I found it meaningful to examine the socioeconomic impact of this pandemic on our communities because understanding the community needs allows for better advocacy for actions and policies that will protect Hawai‘i’s most vulnerable communities. I partnered with my fellow MPH colleague Sydney Unciano and we passionately advocated for Filipino health to be examined since Filipinos have been disproportionately impacted by this pandemic.¹² It was exciting to see our perspectives published in Civil Beat.

Public health plays such an important role in our community health and it has been brought to the forefront because of this pandemic. However, it is also important to know that public health efforts will not end when this pandemic subsides and everything is back to “normal.” Public health will continue to play an important role in the future and this project has made me become a better public health professional.

Sydney Unciano

I am also a MPH student specializing in SBHS at UH Mānoa. As a participant in the HI-EMA interdisciplinary project for my master’s practicum project, I had the opportunity to work with students from various educational backgrounds. Working in an interdisciplinary student team with nursing and social work students introduced me to different care model perspectives. This experience helped me develop effective communication skills and taught me how to critically think of different ways to approach these unprecedented community challenges. Some of the shared responsibilities we had included analyzing qualitative data, creating a formal report of the data analysis, and compiling a list of informative and helpful resources. Aside from collaborating with students from different backgrounds, one of my favorite parts about this opportunity was being able to work with my colleague, Angel, and to use my educational platform to help advocate for Filipino health in the community.¹²

From this project, I have observed the collaborative and diligent efforts of my colleagues and leaders from multiple organizations come together to provide support during this pandemic. I am appreciative of the support and help of my colleagues during this project, as well as the mentorship and guidance provided to direct this project and connect us to various community networks. As the COVID-19 pandemic continues, it is evident that this emergency will require the insights of various disciplines at many different levels. I am optimistic that the continuing efforts of HI-EMA and other associated organizations will be able to provide support during this time of need.

Kira Oyama

I am a graduate student who recently completed my degree in population health nursing at UH Mānoa. I am also currently working as a registered nurse at The Queen’s Medical Center in Honolulu, in the intensive care unit. As a frontline healthcare worker, I was provided the opportunity to be part of and witness the COVID-19 response in the acute care setting. This stirred up a lot of fear and anxiety among the hospital workers as there were many concerns about adequate staffing and supplies.¹³ This sparked my interests in the public health approach to the pandemic, and I was granted the opportunity to work with this interdisciplinary group of students on understanding community needs in Hawai‘i during this trying time.

Through this experience I developed my data collecting and analyzing skills and enhanced my communication abilities through writing and teamwork. I was given the opportunity to work with an amazing group of strong, independent, and passionate leaders in the community who are going to continue doing great work for the community. This experience increased my appreciation for the job done in the public health sector as well as highlighted the incredible challenges that come with it. In what felt like such a short summer session, we accomplished so much in sharing information with the public and highlighting community needs. I look forward to seeing the great work my teammates continue to accomplish particularly as we continue to deal with the short-term and long-term effects of this health care crisis.

Chelsea Emma Apo

I am a graduate student with the UH Mānoa School of Nursing and Dental Hygiene with a background in acute care nursing and a Bachelor of Science in Public Health. As a student, I found that the coronavirus pandemic of 2020 presented a unique situation through which I could apply both my nursing and public health backgrounds and begin to work with professionals of other disciplines in my community. I enjoyed having the opportunity to learn more about the effects of this novel outbreak and to help inform others of the intricacies of needs, responses, and public health considerations involved. I have always believed that health is the outcome of a multitude of factors, and it was interesting to see those factors and people working in the professions that affect those factors come together to fight COVID-19 in Hawai‘i.

Interdisciplinary Engagement and Student Learning

The direct participation in the work of an interdisciplinary team was a valuable experience that provided students with an opportunity to observe how emergencies like COVID-19 are managed on a community-level, including engagement with the academic community.¹⁴ Interdisciplinary training remains critical to health training for the academic, health care, and public health communities in the time of COVID-19 and beyond.¹⁵

Challenges noted in the COVID-19 pandemic are interdisciplinary in nature, and their solutions must be as well. For instance, population mental health needs have expanded due to the increased level of uncertainty and anxiety related to isolation. This was a top community organization concern, including access to behavioral health services. The shift to telemedicine services was also a concern, needing solutions that include providers, the health care system, funders, software, hardware, translation services, and instructions on the proper

use of telehealth technologies. Basic needs (eg, housing, food), financial concerns, and unemployment were all significant concerns, as were health disparities. Some populations were disproportionately impacted, including Pacific Islander and Filipino populations, elder populations, and those with chronic conditions. We completed our initial organizational survey in April and May when the scope and timing of the pandemic were not clear. Schooling and childcare, while ranked as important by organizations in the earlier survey, have since emerged as even more critical to discussions. This area needs multi-sector solutions to keep students, teachers, parents, and family members safe and healthy, and keep teachers employed.

The idea of interdisciplinary work and interdisciplinary education are not new but are growing in health care and public health. Even before this pandemic, a renewed focus on interdisciplinary education emerged when 6 national health profession education organizations came together in 2009 and committed to “advancing interprofessional learning experiences and promoting team-based care”¹⁶ These 6 organization formed the Interprofessional Education Collaborative (IPEC) which would later expand to include 21 associations of health professional schools in 2016.¹⁶

The interdisciplinary student team discussed in this paper aligns to World Health Organization’s definition of interprofessional education, which is “when students from two or more professions learn about, from, and with each other to enable effective collaboration and improve health outcomes.”¹⁷ The team furthermore demonstrated aspects of the 4 competencies that fall under the domain of Interprofessional Collaboration: interpersonal teamwork and team-based practice, interprofessional communication practices, values/ethics for interprofessional practice, and roles and responsibilities for collaborative practice.¹⁸ In its vision for the future, the Interprofessional Education Collaborative sees “Interprofessional collaborative practice drives, safe, high-quality, accessible, person-centered care and improved population health outcomes.”¹⁸ This vision is further supported in the literature that these teams can improve health care quality, including fewer medical errors, lower costs, and shorter hospital stays for patients.¹⁹

Conclusions

Coordinating a safe response to an international emergency is an unprecedented task that requires a vast array of support from the community and a rapid response to quickly adapt to changing policies. This Interdisciplinary Student Team provided valuable contributions to the urgent COVID-19 response, enhanced their own knowledge and learning, and also helped build a stronger future for our community with new networks and understanding of new perspectives from collaborative learning opportunities.

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Time frame: 2 weeks

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Time frame: 2 weeks

8. The sponsor will submit the final articles to the layout editor for formatting. **Time frame: 1 month**

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IMPORTANT: All articles submitted for layout should be in their finalized form. Page proofs will be returned to the sponsor for their review and approval, but changes will only be made to fix any errors that were introduced during the layout process. Any editing or changes to the text or figures after the initial copy layout will incur a fee of \$50 per page.

9. The sponsor will review the electronic copy from the layout editor and submit any final corrections. **Time frame: 5 working days**

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