

# Chronic Non-communicable Disease Risk Factor Survey 2010 among University of the West Indies Staff at Cave Hill, Barbados

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## ABSTRACT

**Objective:** To determine the prevalence of risk factors for chronic non-communicable diseases (CNCDS) among staff of The University of the West Indies (UWI), Cave Hill campus, in Barbados.

**Methods:** A self-administered questionnaire comprising validated questions from the WHO STEPS NCD Risk Factor Survey, the Jamaica Healthy Lifestyle (JHL) Survey and the Behaviour Risk Factor (BRF) Survey, was conducted during the Staff Health Day in May 2010, and at four locations on campus during July 2010. Standardized measurements of weight, height and blood pressure were taken. Data were analysed using EXCEL and STATA and results were compared to the Barbados 2007 STEPS NCD survey.

**Results:** The target population was all staff at the Cave Hill campus of UWI. The coverage rate was 25.2% (269/1068); 63.8% of males and 75% of females were either overweight or obese. Ninety-seven per cent ate less than the recommended 5 fruits and vegetables per day. Low levels of physical activity were reported in 51.9% of males and 62.2% of females. Thirty-two per cent of males and 13% of females were binge drinkers. All participants had at least one of the risk factors (current daily smoker, < 5 fruits and vegetables/day, physical inactivity, overweight/obese and raised blood pressure) whilst 48% of males and 57.2% of females demonstrated three or more risk factors. These results are similar to those found in the Barbados STEPS NCD risk factor survey of 2007.

**Conclusion:** The results confirm a similar high prevalence of NCD risk factors among Cave Hill UWI staff as among the Barbadian population. The study reveals opportunities to inform policy on strategies to positively impact the risk factors.

**Keywords:** Barbados, chronic non-communicable diseases, survey, workplace

# Encuesta de 2010 Sobre Factores de Riesgo de las Enfermedades no Comunicables entre el Personal de la Universidad de West Indies, en el Campus de Cave Hill, Barbados

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## RESUMEN

**Objetivo:** Determinar la prevalencia de los factores de riesgo de ENC's entre el personal de la Universidad de West Indies (UWI), en el campus de Cave Hill, Barbados.

**Métodos:** El Día de la Salud del Personal en mayo de 2010, y en cuatro localidades del campus durante julio de 2010, se aplicó un cuestionario auto-administrado formado por varias preguntas validadas de las encuestas conocidas como WHO STEPS NCD Risk Factor Survey, JHL Survey y BRF Survey. Se hicieron mediciones estandarizadas del peso, la altura, y la presión arterial. Los datos fueron analizados usando EXCEL y STATA, y los resultados fueron comparados como los de la encuesta de Barbados 2007 STEPS NCD.

**Resultados:** La población objeto del estudio estuvo formada por todo el personal en el campus de Cave Hill de la Universidad de West Indies (UWI). La tasa de cobertura fue 25.2% (269/1068); el 63.8% de

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*los varones y el 75% de hembras tenían sobrepeso o eran obesos. Noventa y siete por ciento consumía menos de las 5 frutas y vegetales recomendados por día. Se reportaron bajos niveles de actividad física en 51.9% de los varones y 62.2% de las hembras. Treinta y dos por ciento de los varones y 13% de las hembras eran bebedores consumados.*

*Todos los participantes tenían al menos uno de los factores de riesgo (fumador consuetudinario, < 5 frutas y vegetales/día, inactividad física, sobrepeso/obeso, y alta presión arterial) en tanto que el 48% de los varones y el 57.2% de las hembras mostraron tres o más factores de riesgo. Estos resultados son similares a los hallados en la encuesta Barbados STEPS NCD Risk Factor Survey del 2007.*

**Conclusión:** *Los resultados confirman una alta prevalencia de factores de riesgo de ENC entre el personal de Cave Hill de UWI similar a la existente entre la población barbadense en general. El estudio revela oportunidades de informar las políticas sobre estrategias de modo que puedan lograr un impacto positivo sobre los factores de riesgo.*

**Palabras claves:** Barbados, enfermedades no comunicables crónicas, encuesta, centro de trabajo

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## INTRODUCTION

The Caribbean region of the Americas is the worst affected by the epidemic of chronic non-communicable diseases (CNCDS) which are now the leading cause of premature mortality and account for nearly half of deaths of persons < 70 years of age (1, 2). The epidemic is driven by common risk factors of unhealthy diet, physical inactivity, tobacco use and alcohol abuse and the resulting biological risk factors of hypertension, obesity, hypercholesterolaemia and hyperglycaemia (3). There is a high prevalence of these risk factors in the Barbadian population (4). However, no such risk factor data is available for the staff of The University of the West Indies (UWI) Cave Hill campus in Barbados.

In the face of the potential NCD risks among staff and student populations, the Campus Quality Assurance Office submitted a proposal to the Campus Academic Board for measurement of the health risks for its students and staff. The Administration of the UWI, wishing to improve the risk profile of its staff, requested the Faculty of Medical Sciences and the Campus Quality Assurance Office to conduct an NCD risk factor survey to establish a baseline, and to make evidence-based recommendations for interventions to improve the risk profile of its staff, by instituting an effective workplace wellness programme. Such programmes are cost-effective, sometimes cost-saving, improve performance and employee satisfaction.

## METHODS

### Study population and recruitment

The target population was 100% of the academic, professional, administrative, technical and support staff  $\geq$  18 years, from all departments at the Cave Hill Campus at UWI. The data collection was carried out during Cave Hill's Annual "Health Day" in May 2010, with supplemental data collection during July 2010 at four locations on campus – Maintenance, Administration, the Faculty of Education and the CARICOM building.

A variety of methods were used to publicize the survey and encourage staff to participate. These included an *e-mail* announcement that went to all staff and the distribution of paper fliers and posters around campus. For reasons of confidentiality, it was not possible to send out personalized invitations.

### Data collection instrument

Data were collected using a self-administered questionnaire comprising validated questions from the WHO STEPS NCD Risk Factor Survey (5) [alcohol consumption, physical activity, fruits and vegetables], the Behaviour Risk Factor Survey [tobacco use] (6) and others from the Jamaica Healthy Lifestyles Survey (7).

### Data collection methods

Approval for the study was granted by the Institutional Review Board (IRB), Barbados, the UWI Administration and the Dean, Faculty of Medical Sciences. Participants read and signed the informed consent form. Trained data collectors assisted participants in completing the risk factor profile, if necessary. Weights and heights were measured with the subjects standing erect and shoeless, using a SECA 700 mechanical medical scale with attached stadiometer, to the nearest 0.1 kg and nearest 0.1 cm respectively.

Calibrated Mabis Automatic Digital blood pressure sphygmomanometers (Model 04-591-001) were used to measure blood pressure. The participant's blood pressure was measured once in the sitting position with the back supported, the legs uncrossed, the feet resting on the ground and after a 5-minute rest, using the appropriate sized cuffs, in keeping with CHRC guidelines for BP measurement and screening for hypertension (8). Participants were given a written copy of their physical measurements. All elevated BP readings were repeated and participants counselled by an on-site physician to seek appropriate medical attention in a timely manner for any abnormal reading.

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### Analysis

Definitions are at Table 1. Data were analysed using EXCEL and STATA and crude results compared to the Barbados 2007 STEPS non-communicable disease risk factor survey. Chi-squared significance testing was performed, with  $p \leq 0.05$  considered significant. Point estimates with 95% confidence intervals were also utilized. Logistic regression was used to compare male and female results.

### RESULTS

Detailed results are in Table 2. The overall coverage rate was 25.2% (269/1068). The study population was 30% male and 70% female, compared to the target population of 40.7%

Table 1: Definitions

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**Current smoker:** Every day or some days, as asked in BRFS

**Abstainer:** No alcohol in past 30 days

**Fruits and vegetables:** Either fruit and/or vegetable consumption per day

**Blood pressure:** Actual reading without regard for those on medication – prevalence of uncontrolled blood pressure at 140/90 and at 160/100 (meet either systolic or diastolic criteria)

**Physical activity:**  
Calculation of MET-minutes per week/levels of physical activity  
Moderate activity MET value = 4.0; Vigorous = 8.0  
MET-minutes per week = (minutes per day of moderate PA days per week of moderate PA (\* = x) + (minutes per day of vigorous PA (\* = x) days per week of vigorous PA 8)  
Levels of physical activity – Low: 0 – 600, medium: 600 – 2999, high  $\geq$  3000 METS/week

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Table 2: Risk factors for NCDs in staff at UWI Cave Hill versus all of Barbados

	UWI CAVE HILL NCD Risk Factor Survey			Barbados STEPS NCD Risk Factor Survey 2007 Both Sexes
	Both Sexes	Males	Females	
% participants by gender		30.0%	70.0%	
Number of participant by gender		n = 81	n = 188	n = 1282
<b>TOBACCO USE</b>				
% Current smoker	5.7%	14.3%	2.2%	8.4%
% current smoker 95% CI	(2.9, 8.6)	(6.3, 22.3)	(0, 4.3)	(6.2, 10.6)
Current smokers who stopped smoking $\geq$ 1 day in the past year to try to quit	100.0%	100.0%	100.0%	
<b>ALCOHOL CONSUMPTION</b>				
# % abstainers	57.4%	39.1%	64.9%	62.20%
% abstainers 95%	CI (51.0, 63.7)	(27.3, 50.9)	(57.6, 72.2)	(55.5, 68.8)
<i>Among those who drank alcohol in the last 30 days</i>				
% binge drinkers (men: five or more; women: four or more at a single occasion)	44.0%	53.5%	37.5%	
95% CI binge drinkers	(34.4, 53.5)	(38.0, 69.0)	(25.3, 50.0)	
<b>FRUIT AND VEGETABLES CONSUMPTION</b>				
% who ate < 5 servings of fruit and/or vegetables/day	97.3%	96.3%	98.0%	95.4%
95% CI: % who ate < 5 servings of fruit and/or vegetables/day	(95.4, 99.3)	(92.0, 1.0)	(95.7, 1.0)	(93.6, 97.7)
Mean number of servings of fruits and vegetables each day	140.0%	130.0%	150.0%	2
@ 95% CI: Mean number of servings of fruits and vegetables each day	(1.3, 1.6)	(1.0, 1.5)	(1.4, 1.7)	
<b>PHYSICAL ACTIVITY</b>				
% with low levels of activity (< 600 MET-minutes/week)	59.1%	51.9%	62.2%	51.3%
95% CI: % with low levels of activity (< 600 MET-minutes/week)	(53.2, 65.0)	(40.7, 63.0)	(55.2, 69.2)	(46.1, 56.5)
% with high levels of activity ( $\geq$ 3000 MET-minutes/week)	9.1%	19.8%	4.8%	27.2%
95% CI: % with high levels of activity ( $\geq$ 3000 MET-minutes/week)	(5.8, 12.8)	(10.9, 28.6)	(1.7, 7.9)	(22.7, 31.8)

	UWI CAVE HILL NCD Risk Factor Survey			Barbados STEPS NCD Risk Factor Survey 2007 Both Sexes
	Both Sexes	Males	Females	
<b>PHYSICAL MEASUREMENTS – BODY MASS INDEX</b>				
Mean Body Mass Index – BMI (kg/m <sup>2</sup> )	28.3	27.4	28.7	27.7
Mean Body Mass Index – BMI (kg/m <sup>2</sup> )	(27.6, 29.0)	(26.2, 28.7)	(27.9, 29.5)	(26.7, 28.7)
% who are overweight or obese (BMI ≥ 25 kg/m <sup>2</sup> )	71.6%	63.8%	75.1%	65.20%
95% CI: % who are overweight or obese (BMI ≥ 25 kg/m <sup>2</sup> )	(66.1, 77.2)	(53.0, 74.5)	(68.9, 81.5)	(57.8, 72.6)
% who are obese (BMI ≥ 30 kg/m <sup>2</sup> )	34.5%	31.3%	34.0%	28.5%
95% CI: % who are obese (BMI ≥ 30 kg/m <sup>2</sup> )	(28.7, 40.3)	(20.9, 41.6)	(28.9, 43.0)	(22.3, 34.7)
<b>PHYSICAL MEASUREMENTS – BLOOD PRESSURE</b>				
** Mean systolic blood pressure (mmHg)	121.5	122.6	121.0	120.9
95% CI: Mean systolic blood pressure	(119.5, 123.5)	(119.0, 126.2)	(118.6, 123.4)	(118.5, 123.3)
** Mean diastolic blood pressure (mmHg)	74.9	76.0	74.5	78.9
95% CI: Mean diastolic blood pressure	(73.6, 76.3)	(73.2, 78.7)	(73.0, 76.0)	(77.0, 80.8)
% with raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg)	18.6%	16.3%	19.6%	20.5
95% CI: % with raised BP (SBP ≥ 140 and/or DBP ≥ 90 mmHg)	(13.8, 23.2)	(8.0, 24.5)	(13.8, 25.4)	(14.4, 26.7)
95% CI: % with raised BP (SBP ≥ 160 and/or DBP ≥ 100 mmHg)	1.9%	2.5%	1.6%	6.9%
95% CI: % with raised BP (SBP ≥ 160 and/or DBP ≥ 100 mmHg)	(0.0, 3.5)	(0.0, 6.0)	(0.0, 3.5)	(3.6, 10.3)
<b>SUMMARY OF COMBINED RISK FACTORS</b>				
•current daily smokers; •less than 5 servings of fruits and veg/day; •low level of activity (< 600 MET-minutes); •overweight or obese (BMI ≥ 25 kg/m <sup>2</sup> ); •raised BP (BP ≥ 140 and/or DBP ≥ 90 mmHg)				
% with low risk ( <i>ie</i> none of the risk factors included above)	0.0%	0.0%	0.0%	0.0%
% with raised risk (at least three of the risk factors included above)	54.4%	48.0%	57.2%	44.0%
95% CI: % with raised risk (at least three of the risk factors included above)	(48.2, 60.7)	(36.2, 60.0)	(50.0, 64.7)	(34.7, 53.2)
#	UWI – past month, STEPS, past year			
@	STEPS asked fruit and veg in two questions, so no CI when answers combined			
**	STEPS excluded those on BP medication			
\$\$	STEPS includes those currently on medication			

male and 59.3% female. The coverage rate by gender was 81/435 among males (19%) and 188/633 (30%) among females (Fig. 1).

### Smoking

Average smoking prevalence was lower among the UWI staff than among the Barbadian population (5.7% *versus* 8.4%) but this was not statistically significant. Among UWI staff responding to this survey, males 14.3% (95% CI 6.3, 22.3) were more likely to smoke than females 2.2% (95% CI 0, 4.3). All twelve current smokers reported that they had

stopped smoking for one day or more, in an attempt to quit, during the past year.

### Alcohol use and abuse

The University of the West Indies study population included more abstainers from alcohol use, than among the Barbadian population, 62.2% (95% CI 55.5, 68.8) *versus* 57.4% (95% CI 51.0, 63.7) but this was not statistically significant. Among UWI staff, men were 2.5 times more likely to drink in excess than women (classified as binge drinkers, consuming five or more drinks at a single setting for men and

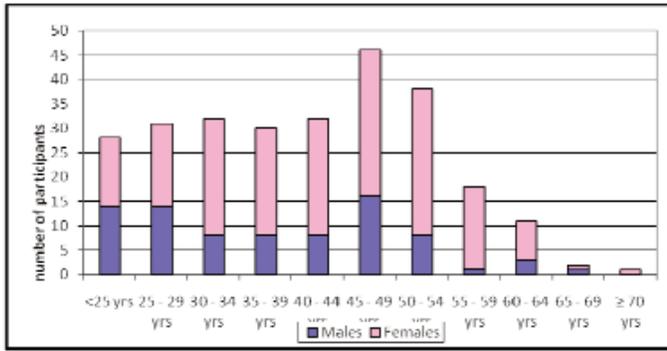


Fig. 1: Age and sex for 269 UWI Cave Hill staff: NCD risk factor survey 2010.

four or more drinks for women) while women were about 50% more likely to be abstainers 64.9 (95% CI 57.6, 72.2) versus 39.1% (95% CI 27.3, 50.9) [Fig. 2].

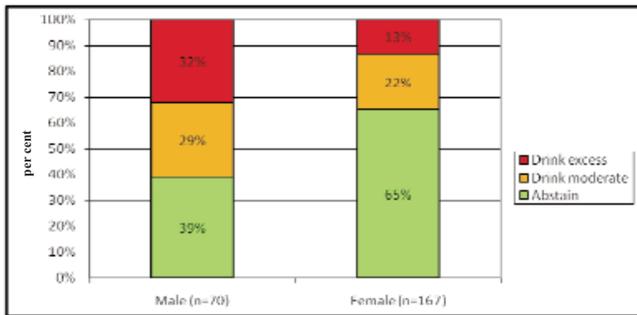


Fig. 2: Abstainers, moderate and excess drinkers by gender, among 237 UWI Cave Hill staff: NCD risk factor survey 2010.

**Dietary habits**

As with the Barbadian population, over 95% of the UWI staff did not eat the recommended 5 servings of fruit and/or vegetables each day, with no significant gender differential. Most reported eating 1 or 2 servings per day (Fig. 3). Other

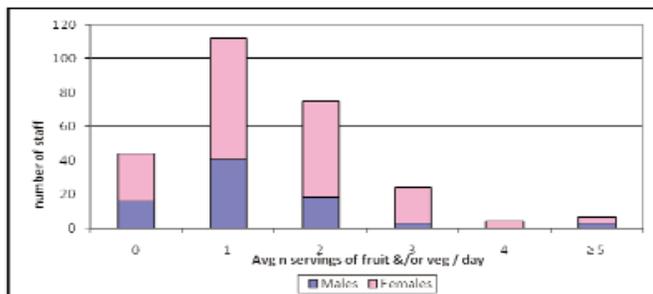


Fig. 3: Average number of servings of fruits and/or vegetables among 266 UWI Cave Hill staff: NCD risk factor survey 2010.

dietary habits included 14% who added salt to their meals at the table, 83% who ate high fat diets with an average 1.4 high fat meals each day and 86% who ate meals out, an average of 4 meals/week.

**Physical inactivity**

Levels of physical activity are defined using MET-minutes/week, with low levels of activity < 600 MET-minutes/week, moderate 600–2999 and high 3000+ (9). Staff of The University of the West Indies were less physically active than the Barbadian population, 59.1% (95% CI 53.2, 65.0) versus 51.3% (95% CI 46.1, 56.5) although this did not attain statistical significance. The University of the West Indies staff was much less likely to have high levels of physical activity (≥ 3000 MET-minutes/week) at 9.1% (95% CI 5.8, 12.8) versus 27.2% (95% CI 22.7, 31.8) [Fig. 4].

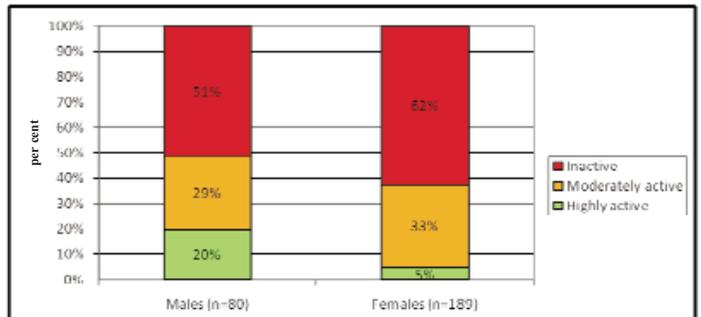


Fig. 4: Activity levels among for 269 UWI Cave Hill staff: NCD risk factor survey 2010.

Among UWI males, 31% reported that they felt fit compared to 19.8% with high levels of physical activity, and among UWI females, 24% self-reported feeling fit versus 4.8% with high levels of physical activity.

**Overweight and obesity**

Prevalence of overweight/obesity among UWI Cave Hill staff is higher than among the Barbadian population: 71.6% (95% CI 66.1, 77.2) versus 65.2% (95% CI 57.8, 72.6) though this did not achieve statistical significance (Fig. 5).

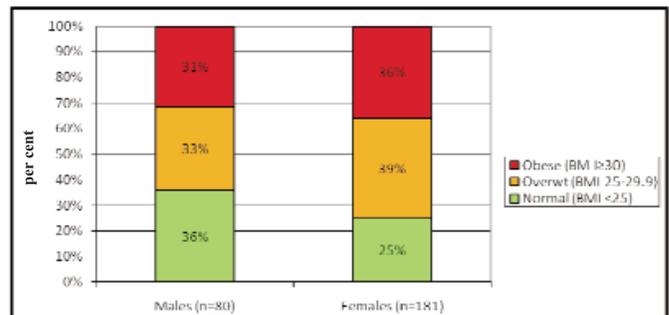


Fig. 5: Per cent normal, overweight and obese, by gender, among 261 UWI Cave Hill staff: NCD risk factor survey 2010.

While 71% of the 75% of overweight or obese women felt that they were obese or overweight, among men, only 53% of the 64% overweight or obese men felt that way.

### High blood pressure

Among men, 16% had elevated blood pressure readings (SBP  $\geq 140$  and/or DBP  $\geq 90$  mmHg) and 2.5% had markedly high levels (SBP  $\geq 160$  and/or DBP  $\geq 100$  mmHg) compared to women with 20% and 1.6%, respectively.

### Risk factor summary

There were no participants in the survey who had zero risk factors being considered whilst 48% of males (95% CI 36.2, 60.0) and 57.2% of females (95% CI 50.0, 64.7) demonstrated three or more risk factors (Fig. 6). The

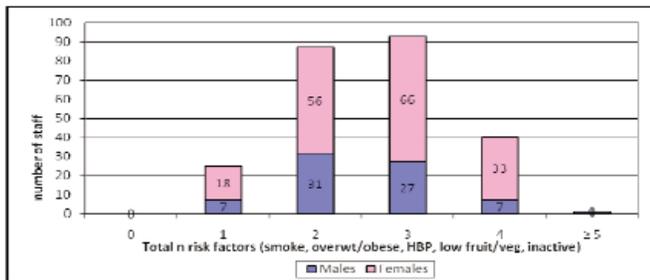


Fig. 6: Risk factors by gender among 246 UWI Cave Hill staff: NCD risk factor survey 2010.

Barbadian population, despite a higher average age, demonstrated a lower prevalence of 3+ risk factors at 44.0% (95% CI 34.7, 53.2)

### DISCUSSION

The results confirm a high prevalence of risk factors for CNCs among the staff sampled at the Cave Hill campus of the UWI; 63.8% of males and 75% of females were either overweight or obese while 97% ate less than the recommended 5 fruits and vegetables per day. Low levels of physical activity were reported in 51.9% of males and 62.2% of females. Thirty-two per cent of males and 13% females were binge drinkers. All participants had at least one of the risk factors (current daily smoker, < 5 fruits and vegetables/day, physical inactivity, overweight/obese and raised blood pressure) whilst 48% of males and 57.2% of females demonstrated three or more risk factors.

These common risk factors of physical inactivity, unhealthy diet, obesity, tobacco use and alcohol abuse are responsible for 80% of cardiovascular disease and 40% of cancers (10, 11). Absenteeism, loss of key staff in their productive years and suboptimal performance due to chronic ill health can be mitigated by creating an environment at the workplace to promote health.

A comparison of the results of this study with the Barbados NCD STEPS risk factor survey 2007, shows results which correlate closely to those of the general island population. However, the population in this present study was younger with more females, which limited and confounded some comparisons.

Other limitations include the low coverage rate of 25.2% with 269 persons out of a possible 1068 participating, and the low participation of male non-support staff. Of those who participated, 30% were male and 70% female, with 20.1% *versus* 43% male respondents in non-support *versus* support staff. Mean age of Cave Hill staff was 41.2 (females 42.6, males 38) years compared to the Barbados STEPS NCD risk survey mean age of 50 years for both males and females and 44% males in their study population. Despite these differences, as well as the “healthy worker” effect, [those in the work-force are generally healthier than the general population (12)] we believe that the similarity of finding with those of the Barbados NCD STEPS risk factor survey gives face validity to our results.

The implications of this study are clear. The University of the West Indies in particular, and Barbados in general, need to create supportive environments where individuals have healthy options and are educated and motivated to choose these options.

The workplace potentially represents a captive population for health promotion. Implementing well-executed worksite chronic disease prevention programmes that can impact positively on the NCD risk factors and can significantly increase health knowledge, improve nutrition and physical activity, and improve many employee health risks in the short term (13). It is important to combine individually oriented interventions with organizational-level strategies to support healthy behaviour, *eg* health-related policies and environmental interventions (14).

Workplace health promotion programmes, targeting physical inactivity and unhealthy dietary habits, are effective in improving health-related outcomes such as obesity, diabetes and cardiovascular disease risk factors and have the potential to improve the health status of workers, contribute to a positive and caring image of the company, improve staff morale, reduce staff turnover and absenteeism, enhance productivity and reduce sick leave (15).

A meta-analysis of workplace disease prevention and wellness programmes found that for every dollar spent on the programme, medical costs dropped by about US\$3.27 and absenteeism costs dropped by about US\$2.73 (16). Thus, workplace wellness programmes are both effective and cost-effective and often cost-saving. Priority recommended evidenced-based workplace wellness initiatives (17, 18) for staff at the Cave Hill Campus are:

- \* Comprehensive workplace wellness programmes with demonstrated support from the UWI administration
- \* Workplace policies which target improved nutrition and healthier menu options *eg* applying the Barbados School Nutrition Policy to UWI Cave Hill Campus
- \* Provision and promotion of multiple options for physical activity programmes and competitions
- \* Tobacco quit supports

- \* Health insurance benefit package to include screening and health promotion, including screening reminders
- \* Communications *eg* videos, printed materials and signs including information on alcohol abuse

Rigorous evaluations of the impact of multiple risk factor worksite interventions are needed in order to fully understand the role of this channel in reducing the prevalence of key multiple risk factors for chronic disease.

There is room for further work and a need for further analysis by department, age and gender.

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