Prevalence of risk factors and lifestyle choices associated with increased cancer in participants from Trinidad and Tobago

Original Research Article

Abstract

The prevalence of risk factors for cancer among demographics, such as age, gender, and ethnicity, as well as lifestyle choices such as alcohol consumption, smoking, and diet were explored in a Trinidadian population. This cross-sectional study was conducted with participants aged 18 years and older with no personal history of cancer. An online questionnaire was created using SurveyMonkey software and distributed via social media platforms to invite eligible persons to participate. The data were analyzed, and descriptive statistics were generated using SPSS 27. A total of 478 valid responses were obtained. Females comprised 72% of the study population, while males comprised 28%. Most participants fell within the 35-44 age bracket (106 persons), followed by the 18-24 age group (100 persons). At least 18.83% of the participants were over 55 years old. Regarding ethnicity, the majority of participants were either Afro-Trinidadian (38.70%), Indo-Trinidadian (28.66%), or mixed (25.52%). It was also found that most respondents did not drink or smoke (61.1 %), although 3.3% of respondents smoke and 15.7% drink once a week. Of the participants, 63.2% had no dietary restrictions, and less than 20.0% were overweight, consumed fast food, red meats, and smoked foods. The most prevalent risk factors for cancer among this target population were family history, age, diet, and weight.

Changes to one's diet, increased physical activity, and proper weight management can help reduce the risk of developing cancer, as well as secondary risk factors.

Keywords: Cancer, risk factors for cancer, lifestyle, diet, Afro-Trinidadian, Indo-Trinidadian.

Introduction

Cancer is the second leading cause of death in the Caribbean and has created tremendous challenges for healthcare services and expenditures throughout the region. According to the World Health Organization (WHO), cancer incidence will increase by 58%, from 84,703 cases in 2015 to 133,937 cases in 2035, and cancer mortality will increase by 67% during this period, from 52,282 to 87,430 deaths (1). Nationals of African ancestry exhibited the highest rates of cancer incidence (243 per 100,000) and mortality (156 per 100,000) compared to their counterparts in East India (incidence: 125 per 100,000; mortality: 66 per 100,000) or mixed ancestry (incidence: 119 per 100,000; mortality: 66 per 100,000) (1)).

Different types of cancers have specific risk factors associated with them; however, certain sociodemographic factors and lifestyle choices generally increase the risk of cancer. Age, for example, is one such socio-demographic factor. Although cancers of the breast, prostate, lung, and bowel can appear at any age, they are more prevalent in the senile population. Other common risk factors include excessive alcohol consumption, obesity, smoking, family history, and exposure to ultraviolet rays (1,2).

Our research outlined the risk factors for various forms of cancer that are present in the population of Trinidad and Tobago. The importance of public awareness of the prevalence of risk factors for cancer cannot be understood. Knowledge of these risk factors will allow members of the public to evaluate their lifestyles and determine if they are putting themselves at risk for

certain malignancies. This research also benefits public health from a medical science point of view, in that researchers can be guided to focus their studies on cancers that are currently prevalent or may become more ubiquitous in the near future due to the current lifestyles of the population. This will foster an environment for a higher quality of treatment since there will be more scientific data related to these cancers, allowing health practitioners to be better equipped to handle the ailments of the population. Essentially, by being aware of what cancers are likely to increase in the population, correct public health policies and measures can educate the population and guide them toward positive lifestyle changes. Regional health authorities will have ample time to prepare for an oncoming surge in certain cancers. Citizens will make more informed decisions concerning their health, as they are now aware of the associated risks that come with specific practices. These measures will work cohesively to lower not only the mortality rate of the cancers but, more importantly, their prevalence, seeing that prevention is always better than the cure.

Certain factors can influence the incidence of cancer in Trinidad and Tobago, which has a population of 1.3 million inhabitants (1). Avoiding alcohol and tobacco use can prevent many types of cancers and their mortality rates (2).

Heavy alcohol drinking and possibly dairy products (not including yogurt) intake increases, while the consumption of coffee, fish, and tea, light-to-moderate alcohol drinking, and several healthy dietary patterns may decrease liver cancer risk (3).

Several studies have shown a significantly stronger association between increased body mass index (BMI) and the incidence of various cancers. For example, obese women are at a higher risk of all-cause and breast cancer-specific mortality than non-obese women with breast cancer (4).

Physical activity can influence cancer risk, and physical activity is beneficial for the prevention of several types of cancer, including breast (5), colon (6), prostate (7,8), endometrial (9), and stomach (6).

Additionally, diet can be a risk factor for many cancers (10). In the Caribbean region, including Trinidad and Tobago, where cancer is the second leading cause of death (1), we conducted a survey to study the demographic factors and lifestyle choices that presumably increase the risk of developing cancer in Trinidadian participants.The aim of this study was to determine the prevalence of risk factors associated with cancer in the population of Trinidad and Tobago. The objectives were to explore the prevalence of demographic factors that increase the risk of developing cancer and to investigate lifestyle choices that increase the risk of cancer among participants.

Materials and methods

Setting

The setting for this study was English-speaking persons living in Trinidad and Tobago through virtual social media platforms.

Methodology

Study Design: This was a cross-sectional study that was carried out to document risk factors present among demographic aspects and lifestyle choices, which increased the likelihood of developing cancer among participants of Trinidad and Tobago.

Study Population: Trinidadian subjects with no personal history of cancer aged 18 years or older.

Study Sample: Participants were selected by random sampling, with the inclusion criteria being Trinidadian subjects with no personal history of cancer, aged 18 years and older. The exclusion criteria were Trinidadian subjects with a personal history of cancer, Trinidadian participants aged < 18 years, prisoners, and people with disabilities.

Sample size: The sample size was 478 valid responses.

Data Collection: An online questionnaire was created on the SurveyMonkey website and used to conduct this study. The link was shared with Trinidadian participants, who responded to questions about socio-demographics and lifestyle choices linked to an increased risk of developing cancer.

The recruitment of participants involved the distribution of an online questionnaire link, along with a flyer explaining the importance of this study, via social media platforms such as WhatsApp, Instagram, and Facebook. Eligible participants were invited to participate in the study.

Data Analysis: The data were validated to ensure that it was complete and then edited to correct the grammar and spelling. It was then electronically entered for statistical analysis using SPSS software version 27. Microsoft Excelwas also used. Chi-squared analysis was used to determine the relationships between variables using simple 2 × 2 contingency tables. A p-value of 0.05% was used for statistical significance.

Data Protection: All data collected were stored on the password-protected SurveyMonkey account and handled by the principal investigator. Data will be stored securely for five years, after which it will be deleted. SurveyMonkey complies with applicable laws and regulations—whether it is the European Union's recent data protection regulation (GDPR) or HIPAA's requirements for collecting and handling protected health information.

Ethical Approval

Ethical approval was obtained from the Campus Ethics Committee of the University of The West Indies, St. Augustine.

Results

TABLE 1:

Number of participants and their genders

		No. of Persons	Percent (%)	Valid Percent (%)
Valid	Female	344	70.1	72.0
	Male	134	27.3	28.0
	Total	478	97.4	100.0
Missing		13	2.6	
Total		491	100.0	

Table 1 shows that although there were 491 participants, 13 did not complete the survey, leaving 478 valid responses. Of these, females, who comprised 72% of the study population, outnumbered males, who made up only 28%.

TABLE 2:

Age groups of participants and their genders

Gender * Age Crosstabulation				
		Gender		Total
		Female	Male	
		Count	Count	Count
Age	18 to 24	69	31	100
	25 to 34	60	26	86
	35 to 44	85	20	105
	45 to 54	78	19	97
	55 to 64	41	19	60
	65 to 74	11	17	28
	75 or older	0	2	2
Total		344	134	478

Table 2 shows that of the 478 participants, most were within the 35-44 age group, closely followed by the 18-24 age group, with a difference of only five participants between them. The most popular age group for females was 35-44, while the most popular for males was 18-24. The oldest age group was the least popular, with only 2 males aged 75 and older.

TABLE 3:

Showing persons of different genders and their race/ ethnicity

Race/Ethnicity* Gender Cross-tabulation					
			Gender		
			Female	Male	Total
Race/ Ethnicity	Afro-Trinidadian	Count	134	51	185

	Hispanic or Latino	Count	8	18	26
	Indo-Trinidadian	Count	102	35	137
	Mixed race	Count	94	28	122
	None of the above	Count	6	2	8
Total		Count	344	134	478

Table 3 shows that there were three primary races/ethnicities among the 478 participants. Most participants (185 persons) were Afro-Trinidadian, while 137 persons were Indo-Trinidadian. Most females and males, 134 and 51 persons respectively, were of African descent. Approximately one-quarter of participants (122 persons) were of mixed race, and the least number of persons were of Hispanic descent, with only 8 females and 18 males.

TABLE 4:

Showing how often persons of different genders engaged in physical activity

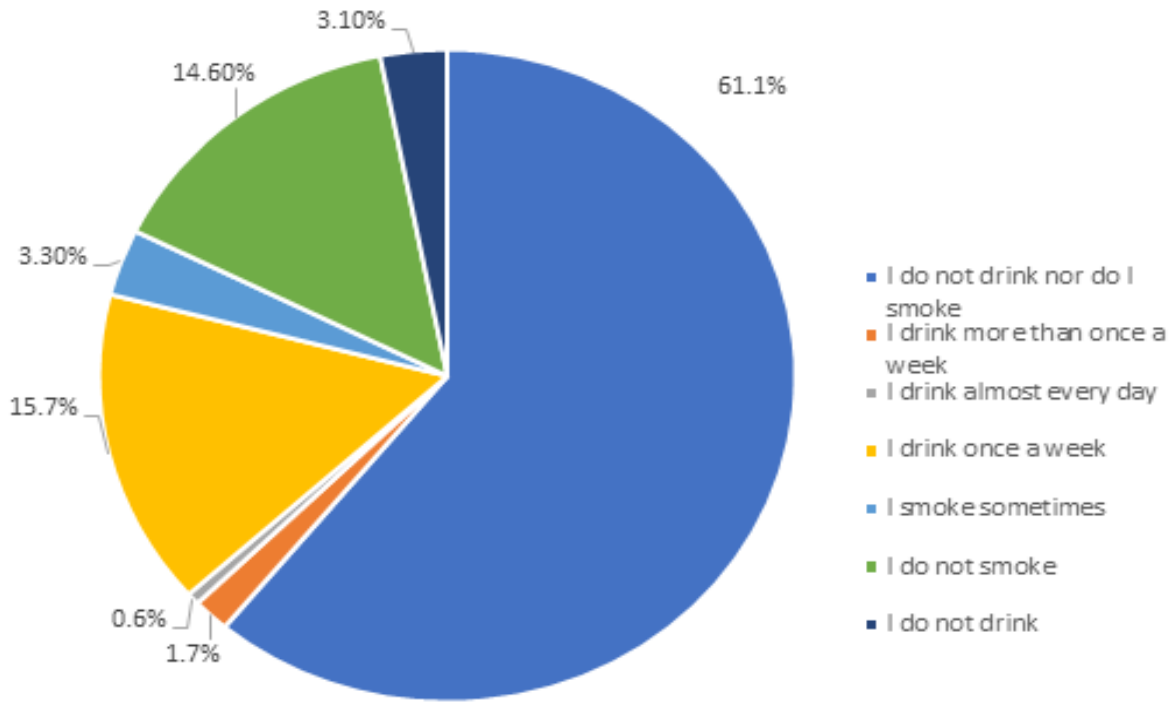
Gender * Physical Activity Crosstabulation

		Gender		
		Female	Male	Total
		Count	Count	Count
Regularity of Physical Activity	A few times a month	40	21	61
	A few times a week	133	58	191
	About once a week	43	14	57
	Every day	52	28	80
	Less than once a month	63	8	71
	Once a month	13	5	18
Total		344	134	478

Table 4 shows that of the 478 participants, most were active, with 191 persons engaging in physical activity a few times a week and 80 persons exercising every day. Most men and women exercised a few times a week. The least number of persons, 18, were active only once a month.

FIGURE 1:

Participants drink and/or smoke frequency



According to Figure 1, the highest percentage of respondents (61.1 %) did not drink or smoke. Only 3.3% of respondents smoked, while 15.7% drank once a week. All 478 participants responded to the question.

TABLE 5:

Participants' gender and alcohol and/or smoke habits

Alcohol/Cigarettes*Gender Crosstabulation					
			Gender		Total
			Female	Male	
Drinking/Smoking Habits	I do not drink nor smoke	Count	242	89	331
	I drink more than once a week	Count	1	8	9
	I drink almost every day	Count	0	3	3
	I drink once a week	Count	61	24	85

As seen in Table 5, most females and males did not drink or smoke, with 242 and 89 responses, respectively. No females drink almost every day, with the smallest number of males (3) beingrecorded for two of the options given: drinking almost every day and not drinking.

FIGURE 2:

Dietary restrictions of participants

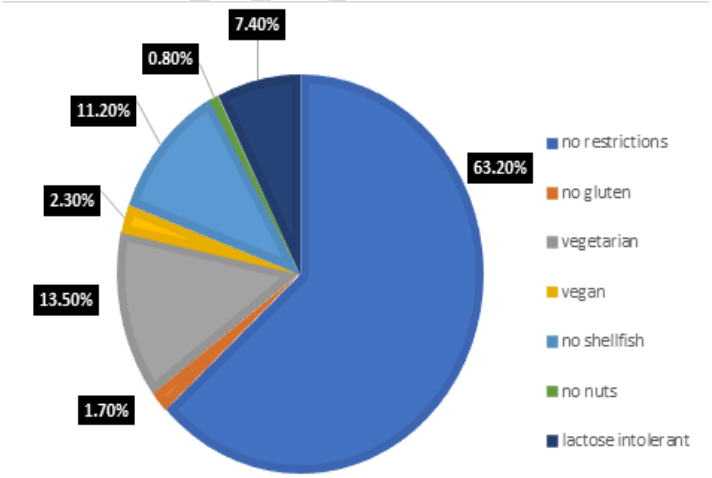


Figure 2 shows that the highest percentage of respondents (63.2 %) had no dietary restrictions. The second most popular selection was a vegetarian diet, with 13.5 % of respondents, and the least popular one was a restriction on nuts, with 0.8% of respondents. It should be noted that of the 478 participants, only 451 provided valid responses.

TABLE 6:

Participants' gender and dietary restrictions

Dietary Restrictions*Gender Cross-tabulation					
			Gender		Total
			Female	Male	
Dietary Restrictions	No restrictions	Count	210	90	300
	No gluten	Count	8	0	8
	Vegetarian	Count	50	14	64
	Vegan	Count	6	5	11
	No shellfish	Count	41	12	53
	No nuts	Count	4	0	4
	Lactose intolerant	Count	28	7	35
Total		Count	325	126	451

According to Table 6, 210 women and 90 men had no dietary restrictions. None of the males had a gluten-free or nut-free diet. The lowest number of females (4) had a nut-free diet.

TABLE 7:

Participants over or under the age of 55 and their dietary restrictions

		Are you over 55 years old?	
		No	Yes
		Count	Count
Dietary Restriction	None	247	53
	Vegetarian	42	22
	Vegan	11	0
	No Shellfish	46	7

According to Table 7, more persons under the age of 55 had no dietary restrictions. More persons under 55 also had a vegetarian and vegan diet. However, 22 people over 55 had a vegetarian diet and zero had a vegan diet.

TABLE 8:

Chi-square test between participants' age and dietary restrictions

Pearson Chi-Square Tests		
		Over 55
Dietary Restrictions	Chi-square	16.715
	df	4
	Sig.	.002*

A chi-square test was also performed between participants' ages and dietary restrictions to determine if there was an association between the two.

FIGURE 3:Lifestyle choices of participants

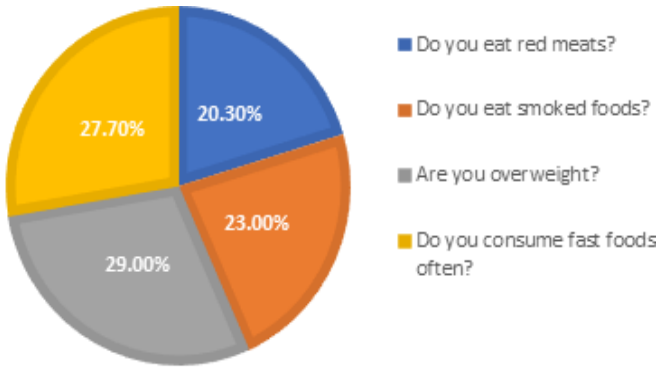


Figure 3 shows that 29.0% of the respondents were overweight. 27.7 Of the respondents, 27.7% consumed fast food. Of the 478 participants, only 473 responses to this question were recorded.

FIGURE 4:

Gender and overweight/obese

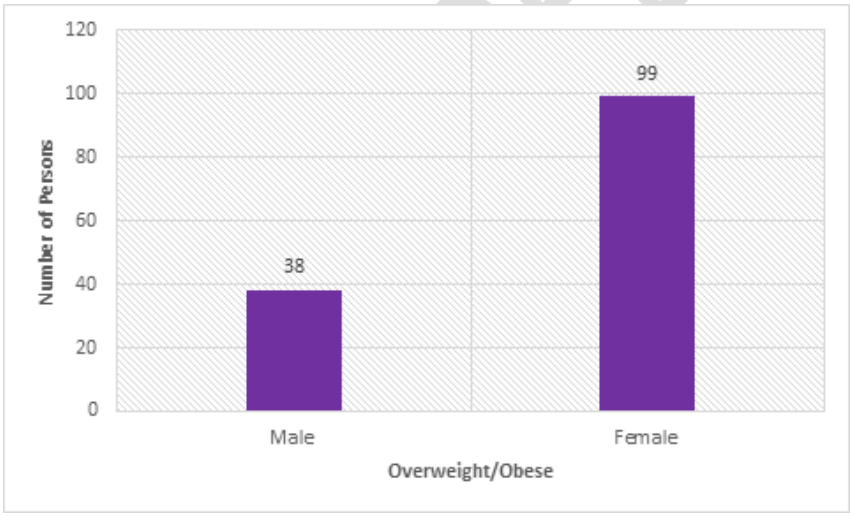


Figure 4 shows that 99 females and 38 males were overweight/obese.

TABLE 9:

Chronic illnesses and gender

Diseases*Gender Crosstabulation					
			Gender		Total
			Female	Male	
Chronic Illness	None	Count	262	100	362
	Diabetes mellitus	Count	23	8	31
	Arterial Hypertension (High Blood Pressure)	Count	45	19	64
	Heart Disease	Count	1	4	5
	Renal Disease	Count	2	1	3
	Liver Disease	Count	3	0	3
Total		Count	322	124	446

Most patients had no disease (Table 9). Arterial hypertension was the most prevalent chronic illness among both sexes, affecting 45 women and 19 men. Renal and liver diseases affected persons the least, with three persons each. Only 446 of the 478 participants responded.

TABLE 10:

Showing participants' race/ ethnicity and their chronic illnesses

Diseases*Race Cross-tabulation								
			Race/Ethnicity					Total
			Afro-Trinidadian	Hispanic or Latino	Indo-Trinidadian	Mixed race	None of the above	
Chronic Illness	None	Count	137	22	105	91	7	362
	Diabetes mellitus	Count	11	0	11	9	0	31

	Arterial Hypertension (High Blood Pressure)	Count	27	4	10	22	1	64
	Heart Disease	Count	2	0	2	1	0	5
	Renal Disease	Count	2	0	0	1	0	3
	Liver Disease	Count	1	0	2	0	0	3
Total		Count	171	26	123	118	8	446

Table 10 shows that across all races/ethnicities, most persons did not suffer from any illnesses. However, most Afro-Trinidadians, 27, were affected by arterial hypertension, while most Indo-Trinidadians, 11, were affected by diabetes. Most persons of mixed descent, 22, were also affected by arterial hypertension.

TABLE 11:

Participants genders with family members who have been diagnosed with cancer

Gender * Family History of Cancer Crosstabulation

			Family Member that Has Been Diagnosed with Cancer			
			Extended member	Immediate member	None of the above	Total
Gender	Female	Count	139	95	106	340
	Male	Count	41	37	55	133
Total		Count	180	132	161	473

Table 11 shows that most females, 139, had an extended family member diagnosed with cancer. Most males, 55, had no family history of cancer. 106 persons in total had no family history of cancer. Five persons did not respondas only 473 out of 478 were recorded.

TABLE 12:

Participants' race/ ethnicity and their family members who have been diagnosed with cancer

Race/Ethnicity* Family History of Cancer Crosstabulation						
			Family Member that Has Been Diagnosed with Cancer			
			Extended member	Immediate member	None of the above	Total
Race/ Ethnicity	Afro-Trinidadian	Count	59	60	65	184
		Expected Count	70.0	51.3	62.6	184.0
	Hispanic or Latino	Count	5	5	15	25
		Expected Count	9.5	7.0	8.5	25.0
	Indo-Trinidadian	Count	64	31	41	136
		Expected Count	51.8	38.0	46.3	136.0
	Mixed race	Count	52	32	36	120
		Expected Count	45.7	33.5	40.8	120.0
	None of the above	Count	0	4	4	8
		Expected Count	3.0	2.2	2.7	8.0
Total		Count	180	132	161	473
		Expected Count	180.0	132.0	161.0	473.0

According to Table 12, the ethnicity with the most persons who had no family history of cancer was Afro-Trinidadian. Afro-Trinidadians also had the most immediate family members with cancer, while Indo-Trinidadians had the most extended family members with cancer.(addprecentages).

TABLE 13:

Chi square test between race and family history of cancer

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	22.272[a]	8	.004
Likelihood Ratio	24.476	8	.002
Linear-by-Linear Association	2.917	1	.088
N of Valid Cases	473		

Discussion

Cancer is the second leading cause of death worldwide. This cross-sectional descriptive study examined common risk factors for cancers such as colon, stomach, glioma, prostate, breast, melanoma, liver, and lung. The survey was based on demographic factors and lifestyle choices that act as risk factors for each of the cancers mentioned above. These include age, gender, ethnicity, family history of cancer, diet, obesity, alcohol consumption, and smoking.

Most participants fell within the 35–44-year-old age group, which had 106 people, with the lower age groups being fairly close in the number of participants. The survey data showed that at least 18.83 % of the participants were 55 years and older. According to existing research, these individuals are at an increased risk for cancers such as melanoma (11), colon (6), stomach (12), liver (3), breast (13), prostate (14,15), ovarian, and cervical cancer (16). Regarding breast cancer, women's risk of developing breast cancer increases with age, with post-menopausal women over the age of 45, being particularly vulnerable (17). Approximately 344 out of the 478 participants were female, 130 of whom were over the age of 45, thus putting them at an increased risk.

Regarding gender, research has shown that women are at a greater risk of developing certain cancers, such as colon cancer (18), while males are more likely to develop melanoma (11), stomach (19), and liver cancer (20). Each sex also has cancer exclusively linked to them, with

prostate cancer that can only develop in males and gynecological cancer in females. Approximately 70% of the participants in this study were female, and 28% were male, putting them at risk of developing the respective cancers.

Usually, ethnic risk factors for cancer are genetically linked. In some cases, ethnic background plays a role in lifestyle factors, such as diet, which gives rise to other secondary risks. However, certain ethnic groups are more prone to cancer than others. For example, there is a greater incidence of prostate cancer among African men (7,15,21–25), including African Caribbean men, than among other ethnic groups due to genetic etiology (26) and the presence of risk alleles (27). In contrast, Caucasian populations with red hair and freckles are greatly affected by melanoma (28), and gynecological cancers also have higher incidence rates among Caucasian women (29). Based on the survey results, there were no Caucasian participants; however, there were 51 Afro-Trinidadian males, whose ethnicity puts them at risk for prostate cancer.

Furthermore, family history of cancer was shown to be the highest among the Afro-Trinidadian participants compared to other ethnic groups (15,25,30–32). About 119 Afro-Trinidadians reported having family members, immediate and extended, who had been diagnosed with cancer. The chi-square test performed with ethnicity and family history of cancer yielded a P-value of 22.272, with a significance value of 0.004. The null hypothesis that these variables are independent of each other would be rejected, indicating an association between them.

Diet plays a significant role in the development of cancer. Based on the results of the survey, 63.2% of the respondents had no dietary restrictions. However, it was found that 20.3% of respondents consumed red meat often, and 23.0 % consumed smoked foods such as ham or

smoked fish. Red meat consumption and consumption of smoked food have been identified as risk factors for multiple cancers, including colon (33), stomach (12), and prostate (7,34–36).

In contrast, research has shown that a diet rich in fresh fruits and vegetables lowers the risk of ovarian, cervical, prostate (7,37,38), and lung cancer (39). Additionally, vegetarians, vegans, and persons who generally avoid animal protein were found to be at a decreased risk of developing prostate cancer (7,35,37,38,40). In this study, 13.5% were vegetarian and 2.3% were vegan. A chi-square test using the age of participants and their dietary restrictions yielded a value of 16.715, with a significance of 0.002. This reveals that the participants' ages influenced their dietary choices, with more people under the age of 55 consuming a vegetarian or vegan diet than those over. There were 22 vegetarians over the age of 55 years, but no vegans. Although the risk of cancer increases with age, the diet of these 22 participants serves as a protective factor against cancer.

Obesity is another factor that has been identified as a risk, particularly associated with the colon (6), prostate (41–44), liver (20), gliomas (45), endometrial, and cervical (46). There is also an indirect link to breast cancer, as research has stated that obesity increases mammographic density, which increases the risk of breast cancer (47). A sedentary lifestyle and a diet high in fast food contributed to weight gain. According to the results of this study, 29.0% of the respondents were overweight (99 females and 38 males). In addition, 27.7% of respondents often consumed fast food. In comparison, exercise is linked to decreased risk of breast (5), colon (6), prostate (7,8), endometrial (9), and stomach cancer (48). A total of 191 persons reported exercising a few times a week; however, the intensity and time frame were not specified. Consuming alcohol increases the risk for cancers of the liver (20), pharynx, larynx, esophagus, colorectum(49), breast (50), and prostate (40,51). Ethanol-mediated carcinogenesis is likely

caused by a combination of factors such as genetic polymorphisms, oxidative stress, alterations in hormone levels, and retinoic acid metabolism (52,53). 0.6 Of the respondents, 0.6% consumed alcoholic beverages almost daily. Clinical research shows that this group is most at risk, since risk increases as alcohol intake rises (54). However, the majority of respondents who consumed alcohol (15.7 %) did so once per week, although it should be noted that the risk depends on the type of cancer as well as lifestyle and demographic factors. For example, research has shown that the positive relationship between alcohol consumption and colorectal cancer varies according to ethnicity, lifestyle factors, the type of alcohol consumed, and anatomical subtype of tumors (55).

According to the CDC, smoking has been linked to at least 16 types of cancer. Within the study population, 3.3 % of the respondents smoked tobacco. Previous studies have shown that tobacco smoking increases the risk of ovarian and cervical (56), prostate (7,57–60), and colon cancer (49). Furthermore, smoking is considered a risk factor for 13% of liver cancers worldwide (61).

Chronic disease is another risk factor for cancer. The population presented with chronic illnesses such as hypertension, liver disease, heart disease, and diabetes. Coronary artery disease, a type of heart disease that affects four male participants in this survey, increases the risk of prostate cancer (62). Diabetes, in contrast, has been shown to increase the risk of developing liver (20) and endometrial cancer (63). In Trinidad and Tobago, a study conducted with 140,300 cases determined that the prevalence of diabetes mellitus in adults was 14.5%. It also stated that, according to the Ministry of Health of Trinidad and Tobago, 1 in 8 of all adults in the Caribbean has diabetes, and that diabetes is more prevalent among females and East Indians when compared with other ethnic groups (64). However, this study showed that only 23 of 263 females and 11 out of 105 Indo Trinidadians had diabetes.

This study investigated risk factors for cancer, such as age, ethnicity, diet, physical activity, diseases, smoking, and alcohol consumption. However, more extensive research can be conducted on the risk associated with exposure to carcinogenic agents such as asbestos, vinyl chloride, and benzene. This would include more participants, since some may work around these agents.

Furthermore, while this study focused broadly on the prevalence of risk factors for cancer among certain demographic and socio-economic aspects, research can be done specifically on these aspects to determine their effect on cancer development. For example, research can be conducted on the socio-economic factors of persons within the region, such as employment and income, to determine how this leads to a diet that is conducive to various forms of cancer. For instance, diets high in red meat are linked to colon cancer.

Conclusion

Based on the results of this study, risk factors for cancer among the participant population stemmed from family history, age, diet, and weight. While genetics and age are not modifiable risk factors, changes to one's diet, increased physical activity, and proper control of weight can help reduce the risk of developing cancer, as well as chronic illnesses that can then lead to cancer.It is important that the target population is educated about their lifestyle choices and how they are putting themselves at a higher risk by performing certain activities. This can be done through seminars/webinars on common risk factors and how they increase predisposition for cancer, as well as the distribution of pamphlets containing the relevant information. Persons who have had cancer can be asked to recount their experiences at these seminars, so the general population is urged to take the information seriously. Furthermore, the results of this study can

be published and made available to all healthcare professionals in the country so that a more proactive approach can be adopted in the selection of patients to undergo screening for possible cancers.

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