Most Common Types Of Cancer Among Saudi Adults In KSA And Associated Risk Factors

Enass Farouk Aboshoushah[1], Hoda Jehad Abousada[2], Yazeed Najeeb Alahmadi[3], Fahad Abdulrahim Lahiq[4],Talal Mohammed Alharbi[5], Hisham Abdulqawi Marish[6], Nawaf Hamoud Alamri[7], Khalid mohammed alamri[8], Hala Yousef Althomali[9], Fatimah Mohammed Alabbadi[10], Hatun Abdullah Alharthi[11], Abdulkarim Muflih Alghaithi[12], Shahad Muneer Abdulaal[13], Abdulrahman Musaad Alshammari[14] and Maher Awad Albalawi[15]

[1] Consultant anesthesia and critical care , MOH, Jeddah, KSA
[2] corresponding Author: Obstetrics & Gynaecology, KFSHRC, KSA
[3] Critical Care Resident, King Saud Medical City، Riyadh, KSA
[4] Critical Care Resident, King Saud Medical City، Riyadh, KSA
[5] Critical Care Resident, King Saud Medical City، Riyadh, KSA
[6] MBBS, Service Doctor, Dr.soliman fakeeh hospital, jeddah, KSA
[7] MBBS, Service Doctor, Ahad Ruffidah general hospital, Abha, KSA
[8] MBBS, Service Doctor, Prince Sultan cardiac center, Riyadh, KSA
[9] Medical Technologist II, King Abdulaziz Medical City, Jeddah, KSA
[10] Medical Technologist II, King Abdulaziz Medical City, Jeddah,KSA
[11] MBBS, Medical intern, Taif University، Taif, KSA
[12] MBBS, Medical Intern, University Of Hail, Hail, KSA
[13] MBBS, Medical intern, Fakeeh College for Medical Sciences, Jeddah, KSA
[14] MBBS, Medical Intern, University Of Hail , Hail, KSA
[15] Nursing Specialist, King Salman Specialist Hospital, Hail, KSA

ABSTRACT

Objective: This study is focused on the evaluation of **demographic, lifestyle, and environmental risk factors** associated with common types of cancers. Then, some attention will also be given to the regional distribution of disease and the awareness level of the diagnosed patients.

Methods: The research will be carried out in both urban and rural areas of Saudi Arabia in order to guarantee demographic and geographic representativeness. The Ministry of Health (MOH)-affiliated primary healthcare clinics, outpatient departments, cancer centers, and government hospitals will all provide data.

Results: The study included 414 participants. The most frequent age among them was 18-28 years old (n=189, 45.7%), followed by 30-39 years old (n=98, 22.5%), then 40-49 years old (n=63, 15.2%). The most frequent gender among study participants was female (n=224, 54.1%) and male (n=190, 45.9%). The most frequent nationality among study participants was Saudi (n= 355, 85.7%), followed by non-Saudi (n= 59, 14.3%). Occupation among study participants, with most of them were employed (n=199, 48.1%), followed by students (n=93, 22.5%), then unemployed (n=87, 21%), and at least retired (n=35, 8.5%). The participants were asked Have you been diagnosed with cancer? most of them answered no (n=406, 98.1%), and yes (n=8, 1.9%). Participants were asked if they undergo regular follow-ups/screening. Most of them answered no (n=186, 44.9%), followed by occasionally (n=131, 31.6%), then

yes (n=97, 23.4%). Participants were asked Do you have any of the following chronic conditions? Most of them were obese (n=157, 37.9%), followed by hypertension (n=140, 33.8%), then diabetes (n=89, 21.5%). Participants were asked about visiting doctors. The most frequent were only when sick (n=190, 45.9%), followed by once a year (n=110, 26.6%), then never (n=77, 18.6%), and every few years (n=37, 8.9%). Participants were asked about awareness programs. The most frequent were no (n=228, 55.1%), and no (n=186, 44.9%). Participants were asked Do you think cancer is preventable through lifestyle modification; Most of them said yes (n=243, 58.7%), followed by not sure (n=89, 21.5%), then no (n=82, 19.8%).

Conclusion: The study showed significant associations between cancer diagnosis and several demographic and lifestyle factors, particularly age, nationality, occupation, smoking, alcohol use, fast-food consumption, and physical inactivity. Gender and marital status were not significantly associated.

INTRODUCTION

With 33 million people, Saudi Arabia is unique among nations in terms of disease epidemiology because it has one of the highest rates of consanguinity in the world. To document the fundamental epidemiology of cancer in Saudi Arabia, the Saudi Cancer Registry (SCR) was founded in 1994. **[1]** Every newly diagnosed case of cancer is documented, along with on-site information and histology, by the SCR, which gathers data from medical facilities across Saudi Arabia. Leukemia (8.2%), non-Hodgkin lymphoma (8.4%), and colorectal cancer (13.3%) were the most prevalent cancer kinds in men, according to a recent SCR analysis that used data up to 2014. **[2], [3]**

Solid tumors are far more prevalent than hematologic malignancies in North American and European (particularly US) nations, which has a significantly different epidemiologic profile. Despite huge cultural changes (diet, living, and consanguinity) during the past 20 years, there is a lack of research on the epidemiology and contemporary trends of cancer in Saudi Arabia. Therefore, we aimed to assess the range and patterns of prevalent cancers in Saudi Arabia nowadays. **[4], [5]**

As the second greatest cause of mortality globally, after cardiovascular illnesses, cancer poses a serious threat to public health. Comprehensive epidemiological studies that identify common cancer forms and the risk factors associated with them are desperately needed, as evidenced by the rising incidence and fatality rates of the disease worldwide. **[3], [6]**

A significant transition in disease patterns from communicable to non-communicable diseases has occurred in many nations, including the Gulf region, in recent decades as a result of lifestyle changes, urbanization, and industrialization. **[7]** Of them, cancer has become one of the Kingdom of Saudi Arabia's (KSA) biggest health burdens, impacting thousands of people each year and resulting in high socioeconomic and medical expenses. Over 20,000 new instances of cancer are reported each year by the Saudi Cancer Registry, indicating a constantly rising cancer prevalence in Saudi Arabia. Women's breast cancer and men's colorectal and liver cancers are the most frequently diagnosed cancers among Saudi adults. Additionally, there has been an increase in thyroid cancer, particularly in young women. **[8]**

This increasing cancer burden is caused by a number of factors, such as demographic shifts like life expectancy and the adoption of Westernized diets and sedentary lifestyles, which have increased rates of obesity, diabetes, and physical inactivity—all known risk factors for different

types of cancer. **[9], [2]** The difficulties in controlling cancer are further exacerbated by low awareness, delayed diagnosis, and insufficient screening programs.

Although statistics at the national level are available, comprehensive cross-sectional studies that comprehensively evaluate the most common cancer types and their risk factors across various regions and demographics within the Kingdom are conspicuously lacking. **[10], [11]** Moreover, a large number of recent research are either out-of-date or restricted to particular towns or hospitals, which limits their applicability to the larger Saudi adult population. Preventive care and population health monitoring are becoming more and more important as the healthcare system develops in accordance with Saudi Vision 2030. **[12]** Creating current data that can support focused cancer prevention and early detection programs becomes essential in this situation. **[13]**

By identifying the most prevalent cancer types among Saudi adults and investigating the risk factors that are linked to them—such as age, gender, family history, smoking habits, dietary patterns, physical activity levels, occupational exposures, and environmental influences—this proposed cross-sectional study aims to close this gap. This study attempts to give a thorough and representative picture of the cancer landscape in the adult population by spanning several Saudi Arabian regions.

Healthcare professionals, legislators, and public health officials will use the study's findings to inform the creation of evidence-based screening programs, health promotion initiatives, and resource allocation plans in addition to adding to the body of existing literature.

All things considered, this study fills a significant gap in Saudi Arabia's continuous attempts to fight cancer with evidence-based treatments. Aiming to improve cancer outcomes through early diagnosis and informed prevention—two crucial pillars in lowering the cancer burden in any population—it is in line with national health priorities.

Rationale of the Study

In Saudi Arabia, where a major epidemiological shift has occurred in recent decades, cancer is becoming a more serious public health concern. Non-communicable diseases, especially cancer, have become the main causes of morbidity and mortality as the burden of communicable diseases decreases. **[14]** Over 20,000 new cases of cancer are diagnosed each year, according to the Saudi Cancer Registry (SCR), and this number is predicted to rise as a result of changing lifestyles, an aging population, and increased environmental exposures. **[15]** The available information on the prevalence of cancer types and related risk factors in Saudi adults is still fragmented, region-specific, or out-of-date, despite this alarming trend. Thus, a thorough, countrywide investigation is desperately needed to determine the most prevalent cancers and the factors that contribute to them in the Kingdom's adult population. **[16], [17]**

In light of Saudi Arabia's ongoing health revolution, as described in Vision 2030, this study is particularly pertinent. Strong data that can direct efficient decision-making is necessary given the emphasis on public health awareness, early detection, and preventive healthcare. Establishing focused screening programs, preventive measures, and health education campaigns that are suited to the particular requirements of the Saudi populace requires an understanding of the most common malignancies and the environmental or lifestyle factors that influence their incidence. Thyroid and breast cancers are the most common cancers in women, and they typically strike patients earlier than is typical for the world. **[18], [19]**

The three most common cancers in men are colorectal, liver, and prostate cancers. Because of a number of issues, such as social stigma, ignorance, poor health-seeking behavior, and insufficient screening, a startling number of patients in Saudi Arabia arrive with cancer at an advanced stage. **[20], [21]** These facts highlight the importance of identifying and addressing

underlying risk factors, including genetic predisposition, smoking, poor dietary habits, obesity, physical inactivity, and occupational hazards. It is also necessary to gain a deeper understanding of the various cancer profiles that may arise from regional and cultural variations in lifestyle patterns within the Kingdom. **[22]**

The paucity of extensive cross-sectional studies that examine these problems in a representative adult sample from several Saudi Arabian areas serves as another significant justification. The majority of current research is hospital-based or disease-specific (for example, only focusing on breast cancer), which restricts the findings' applicability to the general public. A precise picture of cancer trends and risk factors in Saudi adults can be obtained with the use of a carefully planned cross-sectional survey that is carried out across a range of healthcare institutions and demographic strata. Furthermore, global trends indicate that the etiology of cancer is shifting toward modifiable risk factors, meaning that prevention can greatly lower the overall burden of disease. **[23]** Saudi Arabia is especially at risk due to its high rates of obesity, diabetes, and sedentary lifestyles. By recognizing and measuring these hazards in the local context, policymakers and medical experts can take preventative action.

In conclusion, this research is important and timely. It will offer useful epidemiological information on the most prevalent cancer types and risk factors linked to them in Saudi adults. Future screening recommendations and national cancer control initiatives will be influenced by the findings, which will ultimately help raise the Kingdom's early detection and survival rates.

METHODS

Study design

The research will be carried out in both urban and rural areas of Saudi Arabia in order to guarantee demographic and geographic representativeness. The Ministry of Health (MOH)-affiliated primary healthcare clinics, outpatient departments, cancer centers, and government hospitals will all provide data.

Study approach

The research will be carried out in both urban and rural areas of Saudi Arabia in order to guarantee demographic and geographic representation. The Ministry of Health (MOH)-affiliated primary healthcare clinics, outpatient departments, cancer centers, and government hospitals will all provide data.

Study population

The target population consists of Saudi nationals who are at high risk (based on screening or family history) or who have been diagnosed with any type of cancer and are at least 18 years old. Participants in the study will be male and female, representing a range of age groups, socioeconomic backgrounds, and geographical locations.

Study sample

We will calculate the sample size using standard prevalence estimation formulas. Assuming a 95% confidence interval, a 5% margin of error, and an expected prevalence of 50% for any type of cancer—used to ensure the maximum required sample size—the minimum sample size is estimated to be approximately 385 participants. To allow for subgroup analyses and to account for potential incomplete responses or non-response, a final target sample size of 414 participants will be sought.

Study tool

For the current study, a questionnaire was used for data collection and was also considered a study tool.

Data collection

A **structured questionnaire** will be used, consisting of the following sections:

- ✧ Demographics: Age, gender, education, occupation, region.
- ✧ Clinical history: Type of cancer, stage at diagnosis, family history.
- ✧ Lifestyle factors: Smoking, physical activity, diet, and BMI.
- ✧ Environmental/occupational exposure history.
- ✧ Screening behavior and healthcare access.
- ✧ Medical records will also be reviewed for diagnostic verification.

Data will be analyzed using **SPSS Version. 27.0**

Data analysis

All variables will be presented as frequencies and percentages according to their nature. The Chi-square test will be used to assess associations between categorical variables, and statistical significance will be set at $p < 0.05$.

Ethical considerations

It will be carried out on 10% of the total respondents (may be 30-40), and the results will be checked thereof. Further, any type of discrepancy will be removed, and the questionnaire or data sheet will be revised. A pilot study may also be conducted to state the precision level of the statistical tools and even the selection criteria of the respondents. The above-stated process will be followed throughout the pilot study, and the outcomes will be analyzed. The duration, manner, and viability will also be evaluated.

RESULTS

The study included 414 participants. The most frequent age among them was 18-28 years old (n=189, 45.7%), followed by 30-39 years old (n=98, 22.5%), then 40-49 years old (n=63, 15.2%). Figure 1 shows the age distribution among study participants. The most frequent gender among study participants was female (n=224, 54.1%) and male (n=190, 45.9%). Figure 2 shows the gender distribution among study participants. The most frequent nationality among study participants was Saudi (n= 355, 85.7%), followed by non-Saudi (n= 59, 14.3%). Figure 3 shows the distribution of Gender among study participants.

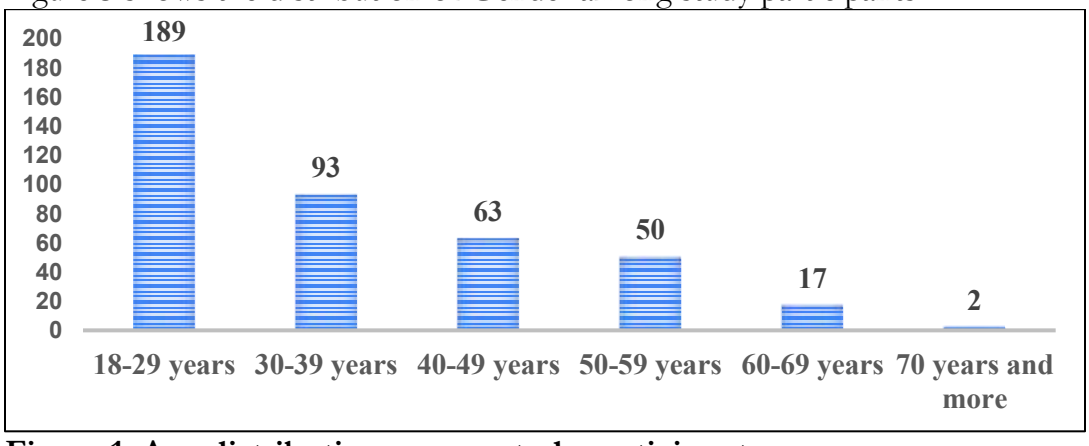

Figure 1: Age distribution among study participants

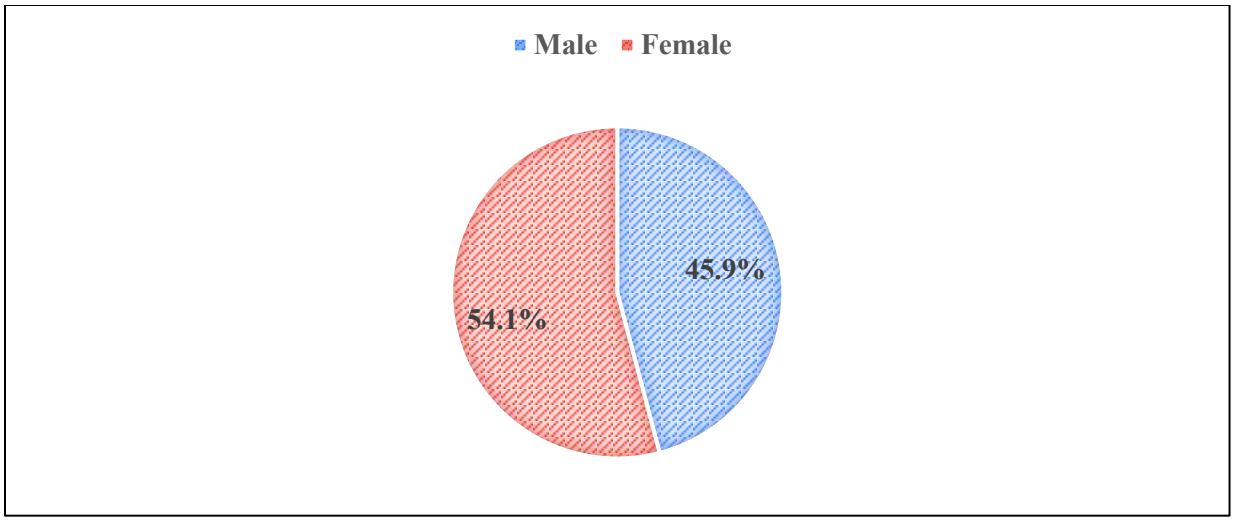

Figure 2: Gender distribution among study participants

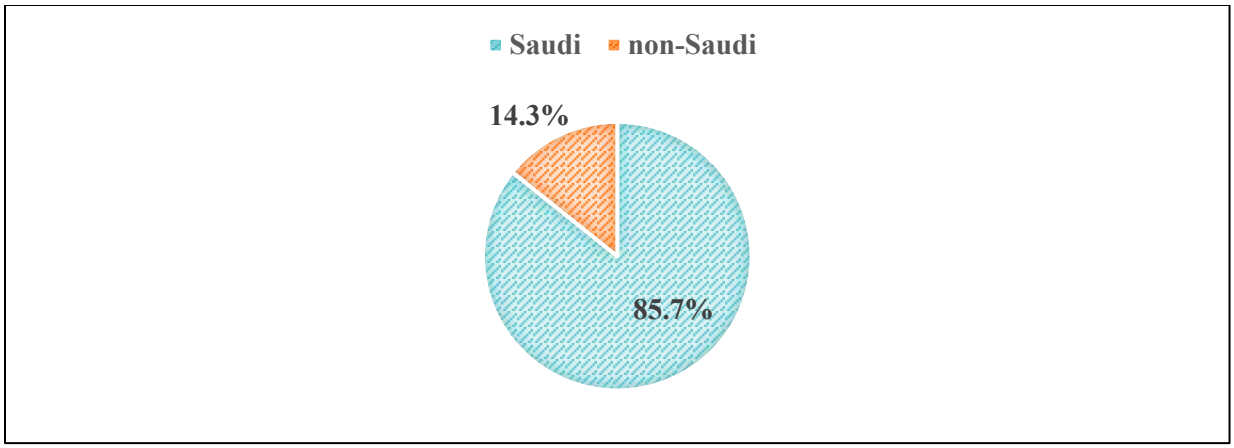

Figure 3: Nationality distribution among study participants

Occupation among study participants, with most of them were employed (n=199, 48.1%), followed by students (n=93, 22.5%), then unemployed (n=87, 21%), and at least retired (n=35, 8.5%).

The participants were asked Have you been diagnosed with cancer? most of them answered no (n=406, 98.1%), and yes (n=8, 1.9%). The diagnosis of cancer is presented in Figure 4.

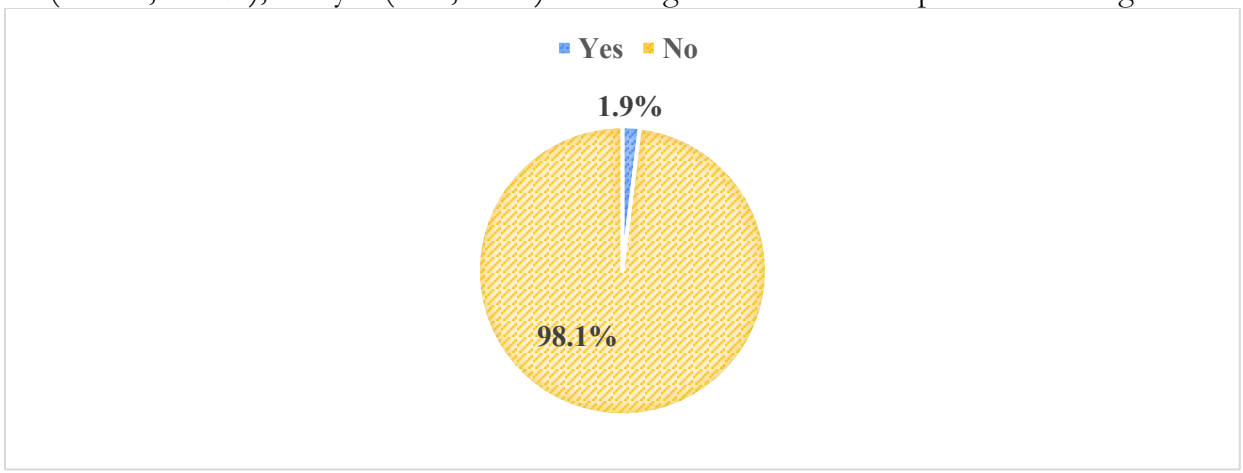

Figure 4: Diagnosis of cancer distribution among study participants

PARTICIPANTS were asked if they undergo regular follow-ups/screening. Most of them answered no (n=186, 44.9%), followed by occasionally (n=131, 31.6%), then yes (n=97, 23.4%). Figure 5 shows the distribution of regular follow-ups/screening among study participants.

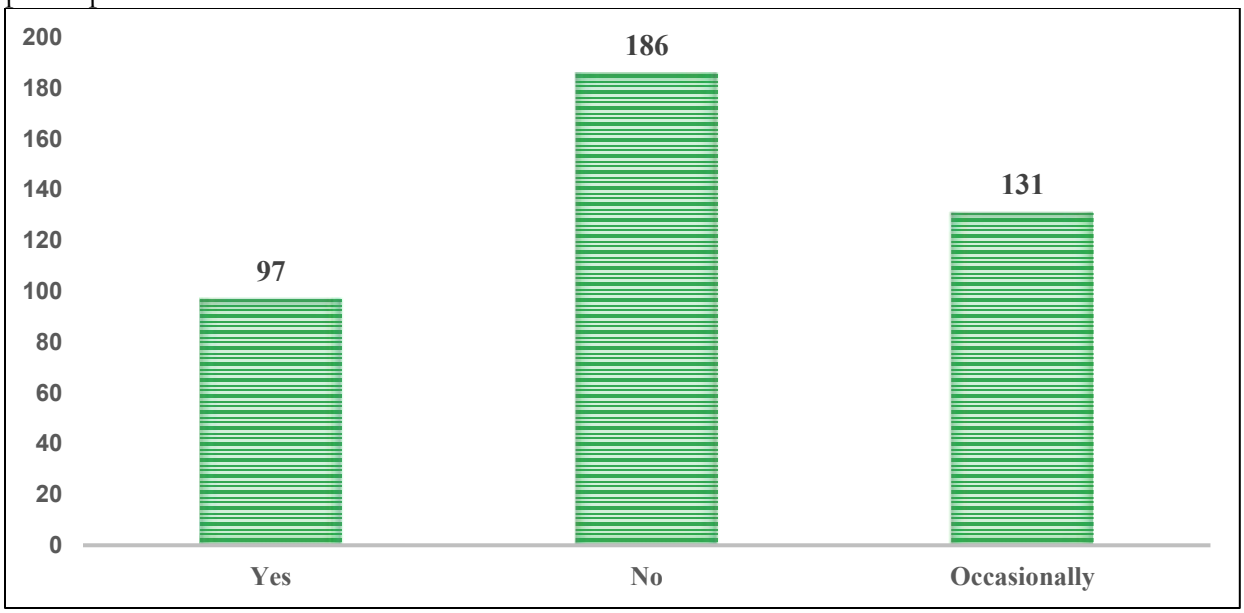

Figure 5: Regular follow-ups/ screening distribution among study participants

Participants were asked Do you have any of the following chronic conditions? Most of them were obesity (n=157, 37.9%), followed by hypertension (n=140, 33.8%), then diabetes (n=89, 21.5%).

Participants were asked about health risk factors and screening practices. Their responses and results are presented in Table 1.

Table 1: Health Risk Factors and Screening Practices

survey item	Yes	No
Do you chew tobacco or use shisha?	73 (17.6%)	341 (82.4%)
Do you consume alcohol?	1 (0.2%)	413 (99.8%)
Have you been exposed to industrial chemicals or radiation in your work?	32 (7.7%)	382 (92.3%)
Have you ever undergone any cancer screening tests?	95 (22.9%)	319 (77.1%)

Participants were asked about visiting doctors. The most frequent were only when sick (n=190, 45.9%), followed by once a year (n=110, 26.6%), then never (n=77, 18.6%), and every few years (n=37, 8.9%).

Participants were asked about awareness programs. The most frequent were no (n=228, 55.1%), and no (n=186, 44.9%).

Participants were asked Do you think cancer is preventable through lifestyle modification; Most of them said yes (n=243, 58.7%), followed by not sure (n=89, 21.5%), then no (n=82, 19.8%). Figure 6 shows participants' lifestyle modification.

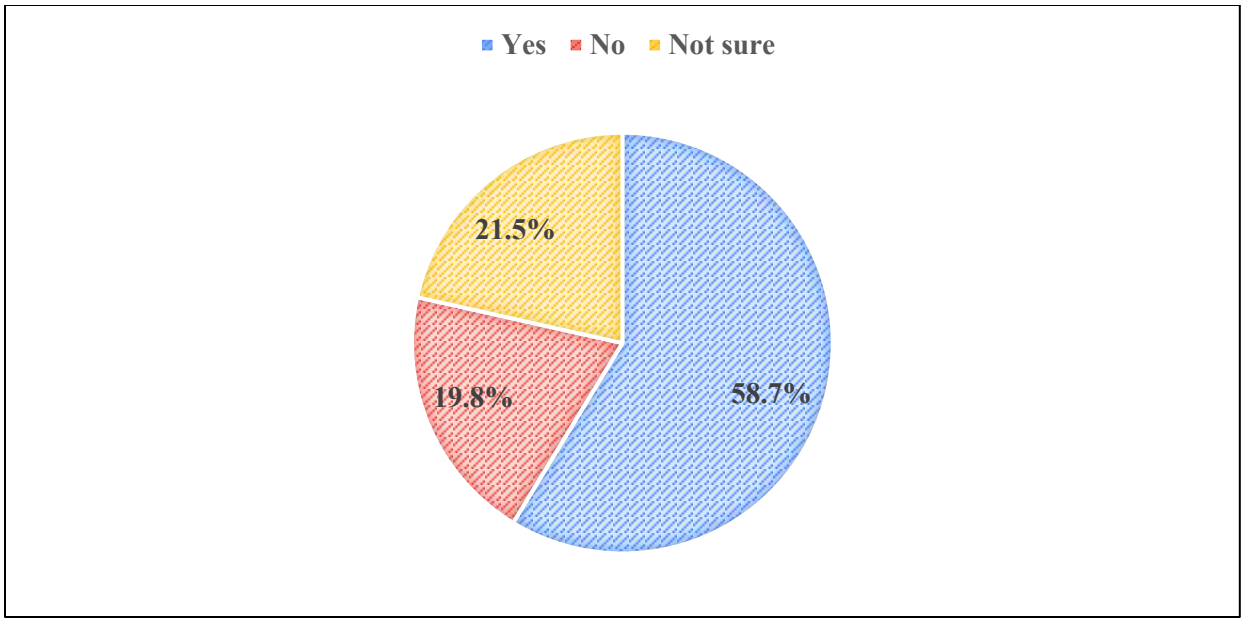

Figure 6: lifestyle modification distribution among study participants

DISCUSSION

The results highlight the strong influence of lifestyle-related risk factors on cancer occurrence. Low screening uptake and high prevalence of obesity warrant targeted public health interventions.

CONCLUSION

The study showed significant associations between cancer diagnosis and several demographic and lifestyle factors, particularly age, nationality, occupation, smoking, alcohol use, fast-food consumption, and physical inactivity. Gender and marital status were not significantly associated .

Cancer risk among Saudi adults is influenced by modifiable lifestyle factors. Strengthening prevention and screening programs is crucial to reduce cancer burden.

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ANNEX 1: DATA COLLECTION TOOL

1. Age:
   a) 18-29 years
   b) 30-39 years
   c) 40-49 years
   d) 50-59 years
   e) 60-69 years
   f) 70 years and more
2. Gender:
   a) Male
   b) Female
3. Marital Status:
   a) Single
   b) Married
4. Nationality:
   a) Saudi
   b) Non-Saudi
5. Occupation:
   a) Employed
   b) Unemployed
   c) Retired
   d) Student
6. Have you been diagnosed with cancer?
7. a) Yes
   b) No
7. Type of cancer:
   a) Breast b) Thyroid c) Colorectal
   d) Liver e) Lung f) Prostate

g) Cervical h) Leukemia i) Skin
j) Urinary Bladder k) Kidney and Ureter
l) Other

8. Year of diagnosis: _____
9. Cancer stage at diagnosis (if known):
☐ Stage I ☐ Stage II ☐ Stage III ☐ Stage IV ☐ Not sure
10. Family history of cancer:
a) Yes
b) No
c) Don't know
11. If yes, specify relation and cancer type: _____
12. Are you currently undergoing cancer treatment?
a) Chemotherapy
b) Radiotherapy
c) Surgery
d) Hormonal
e) Not in treatment
13. Do you undergo regular follow-ups/screening?
a) Yes
b) No
c) Occasionally
14. Do you currently smoke or have smoked in the past?
☐ Yes – Current ☐ Yes – Former ☐ Never
15.If yes, how many cigarettes per day? _____
16.Do you chew tobacco or use shisha?
a) Yes
b) No
17. Do you consume alcohol?
a) Yes
b) No
18. On average, how many servings of fruits and vegetables do you eat per day?
☐ 0–1 ☐ 2–3 ☐ 4–5 ☐ More than 5
19. How often do you eat processed or fast food?
☐ Rarely ☐ 1–2 times/week ☐ 3–5 times/week ☐ Daily
20. How often do you exercise per week?
a) None
b) 1–2 days
c) 3–5 days
d) Daily
21. Do you have any of the following chronic conditions? (Check all that apply)
a) Obesity
b) Hypertension
c) Diabetes
d) Thyroid Disorder
f) Psychological Disorders
g) None

22.Have you been exposed to industrial chemicals or radiation in your work?
a) Yes
b) No
23.Have you ever undergone any cancer screening tests?
a) Yes
b) No
24. If yes, which of the following:
a) Mammogram
b) Colonoscopy
c) Pap smear
d) PSA test
e) Other _____
25. How often do you visit a doctor for general checkups?
a) Once a year
b) Every few years
c) Only when sick
d) Never
26. Are you aware of any national cancer awareness programs?
a) Yes
b)No
27. Do you think cancer is preventable through lifestyle modification?
Yes ☐ No ☐ Not sure

APPENDIX 2: Participants' responses to scale items

age	Frequency	Percent
18-29 years	189	45.7
30-39 years	93	22.5
40-49 years	63	15.2
50-59 years	50	12.1
60-69 years	17	4.1
70 years and more	2	0.5
Total	414	100.0

gender	Frequency	Percent
Male	190	45.9
Female	224	54.1
Total	414	100.0

Marital Status	Frequency	Percent
Single	214	51.7
Married	200	48.3
Total	414	100.0

Nationality	Frequency	Percent
Saudi	355	85.7

non-Saudi	59	14.3
Total	414	100.0

Occupation	Frequency	Percent
Employed	199	48.1
Unemployed	87	21.0
Retired	35	8.5
Student	93	22.5
Total	414	100.0

Diagnosed cancer	Frequency	Percent
Yes	8	1.9
No	406	98.1
Total	414	100.0

Type of cancer	Frequency	Percent
Breast	3	37.5%
Thyroid	1	12.5%
Colorectal	1	12.5%
Liver	1	12.5%
Lung	0	
Prostate	1	12.5%
Cervical	0	
Leukemia	0	
Skin	1	12.5%
Urinary Bladder	0	
Kidney and Ureter	0	
Other	0	

Year of diagnosis	Frequency
2016	1
2017	2
2018	1
2019	1
2021	1
2023	1
2024	1

Cancer stage at diagnosis	Frequency	Percent
Stage I	1	12.5%
Stage II	5	62.5%
Stage III	0	0.0%
Stage IV	0	0.0%
Not sure	2	25.0%

Family history of cancer:	Frequency	Percent
Yes	5	62.5%
No	3	37.5%
Don't know	0	0.0%

regular follow-ups	Frequency	Percent
Yes	97	23.4
No	186	44.9
Occasionally	131	31.6
Total	414	100.0

smoke	Frequency	Percent
Yes – Current	62	15.0
Yes – Former	51	12.3
Never	301	72.7
Total	414	100.0

tobacco or shisha	Frequency	Percent
Yes	73	17.6
No	341	82.4
Total	414	100.0

alcohol	Frequency	Percent
Yes	1	0.2
No	413	99.8
Total	414	100.0

processed fast food	Frequency	Percent
Rarely	179	43.2
1–2 times/week	153	37.0
3–5 times/week	58	14.0
Daily	24	5.8

Total	414	100.0

exercise	Frequency	Percent
None	113	27.3
1–2 days	165	39.9
3–5 days	109	26.3
Daily	27	6.5
Total	414	100.0

chronic conditions	Frequency	Percent
Obesity	157	37.9
Hypertension	140	33.8
Diabetes	89	21.5
Thyroid Disorder	28	6.8
Total	414	100.0

industrial chemicals	Frequency	Percent
Yes	32	7.7
No	382	92.3
Total	414	100.0

undergone cancer screening	Frequency	Percent
Yes	95	22.9
No	319	77.1
Total	414	100.0

If yes, which of the following:	Frequency	Percent
Mammogram	47	45.6%
Colonoscopy	27	26.2%
Pap smear	16	15.5%
PSA test	8	7.8%
Other _____	5	4.9%

visit doctor	Frequency	Percent
Once a year	110	26.6
Every few years	37	8.9
Only when sick	190	45.9
Never	77	18.6
Total	414	100.0

awareness programs	Frequency	Percent
Yes	186	44.9
No	228	55.1
Total	414	100.0

lifestyle modification	Frequency	Percent
Yes	243	58.7
No	82	19.8
Not sure	89	21.5
Total	414	100.0

Chi-Square:

Test Statistics						
	age	gender	Marital Status	Nationality	Occupation	Diagnosed cancer
Chi-Square	327.043[a]	2.792[b]	.473[b]	211.633[b]	137.150[c]	382.618[b]
df	5	1	1	1	3	1
Asymp. Sig.	.000	.095	.491	.000	.000	.000
a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 69.0.						
b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 207.0.						
c. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 103.5.						

Test Statistics						
	Diagnosed cancer	Regular follow-ups	smoke	alcohol	processed. fast-food	exercise
Chi-Square	382.618[a]	29.232[b]	289.232[b]	410.010[a]	159.816[c]	94.251[c]
df	1	2	2	1	3	3
Asymp. Sig.	.000	.000	.000	.000	.000	.000
a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 207.0.						
b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 138.0.						
c. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 103.5.						

p-value (age, nationality, occupation, regular follow-up, smoke alcohol, fast-food, exercise) < 0.05
p-value (gender, marital status) >0.05