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ORIGINAL RESEARCH

care, the clinical endpoints and patient outcome of care [1].

India has one of the highest cancer incidence and mortality rates in the world. A good surveillance system in the form of cancer registries is important for planning and evaluating cancer-control activities [2]. Cancer

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A hospital based cancer registry in a tertiary care centre of South India

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Abstract

Introduction: Hospital based cancer registry maintains data on all newly diagnosed and treated cancer patients in a particular hospital. This helps in the estimate of magnitude of cancer and the pattern of cancer. We did not have cancer registry from Kanyakumari Government Medical College. So, this study was aimed to assess the burden of cancer since the inception of Kanyakumari Government Medical College and to analyse the pattern of the reported malignant cases.

Methodology: This is a retrospective observational study. Institutional research and ethical clearance obtained. Records from the year 2006 to 2022 were retrieved from the pathology department of Kanyakumari Government Medical College. All the malignant cases were entered in access database according to ICD-10 classification and were further categorised based on the patient's age, sex and site of origin of the tumour. A quantitative analysis was made and exhibited in tables and graphs.

Results: Relative proportion of cancer is more among females (5%) than men (4.3%). The top five leading cancer sites in female in descending order of frequency are breast, female genital tract, stomach, skin, tongue and larynx.

Conclusion: This study shows that the magnitude of cancer cases reported at Kanyakumari Government Medical College over a period of 2006 to 2022 is less compared to the nearby districts. Female breast cancers are at increasing trend. In males it is oral cavity cancer. This data could help to document, analyse and set a base for population based cancer approach in and around Kanyakumari District.

Keywords: hospital based cancer registry; Kanyakumari; relative proportion male: female; breast cancer; oral cancer; ICD-10

Introduction

Hospital based cancer registry maintains data on all newly diagnosed and treated cancer patients in a particular hospital. This helps in the estimate of magnitude of cancer and the pattern of cancer. Cancer registry programs were started way back from 1980s in India by ICMR. Since then, cancer registry has been maintained all over India. Even though we get to see data from South Tamil Nadu, we did not have cancer registry from Kanyakumari Government Medical College. So, this study is aimed to assess the burden of cancer since the inception of Kanyakumari Government Medical College and to analyse the pattern of the reported malignant cases. Thereby we initiate and maintain a track of the reported cancer cases in our facility. This will contribute to active follow-up of cancer patients. Hospital based cancer registry can potentially help, support a better understanding of health care system, process of cancer

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registration in India should be complemented with a nationwide effort to foster systematic investigations of cancer patterns and trends by states, regions and sub populations and allow a continuous cycle of measurement, communication and action [2].

This study was aimed to assess the burden of cancer from 2006 to 2022 in Kanyakumari Government Medical College and analysed the pattern of the reported malignant cases.

Materials and methods

This is a retrospective observational study. Institutional research and ethical clearance obtained. Records from the year 2006 to 2022 were retrieved from the pathology department of Kanyakumari Government Medical College. All the malignant cases reported were included except the blood malignancies. The collected data were entered in access database. The data were organised according to ICD-10 classification and are further categorised based on the gender and site of origin of the tumour.

The results were entered in cross tab and quantitative analysis was made to find out the percentage, the mean values and are exhibited in tables and graphs.

Results

35022 biopsy specimens were received in the Department of Pathology, Kanyakumari Government Medical College from 2006 to 2022. In this 3266 cases were diagnosed as cancer by light microscopic method, with male and female percentage of 4.3% and 5% respectively (Table 1).

Table 1: Number (n) and relative proportion (%) of cancer
cases reported in the Department of Pathology, Kanyakumari
Govt. Medical College from 2006 to 2022.

Period 20	006 -2022	
Male		
	No. of cancer (n)	1515
	% of cancer among total biopsies	4.3
Female		
	No. of cancer (n)	1751
	% of cancer among total biopsies	5.0
Total		
	Total No. of cancer (n)	3266
	No. of all Biopsy specimens (n)	35022
	% of cancer among total biopsies	9.3

Table 2 shows that head and neck cancers are the frequently reported cancers and the least presented cancers are carcinoma of adrenal gland and carcinoma of eye. Breast cancers predominates to female patients.

Table 2: Number (n) and relative proportion (%) of cancers on various sites reported from 2006 to 2022.

	ICD-10	М	lale	Fer	nale	Та	tal
Site		n	% (all sites)	n	% (all sites)	n	% (all sites)
Head & neck	C00 – C06, C09 – C14, C32	688	45.4	239	13.7	927	28.4
Gastro intestinal tract	C15 – C25	361	23.8	165	9.4	526	16.1
Breast	C50	18	1.2	596	34	614	18.8
Gynaecological cancers	C51 – C58	0	0	429	24.5	429	13.1
Skin	C43 - C44	131	8.6	80	4.6	211	6.5
Thyroid	C73	21	1.4	104	5.9	125	3.8
Male genetal tract	C60 – C63	80	5.3	0	0	80	2.5
Kidney & urinary bladder	C64 - C67	38	2.5	23	1.3	61	1.9
Lungs	C33 - C34	29	1.9	8	0.5	37	1.1
Retroperitoneum & soft tissue	C48 - C49	23	1.5	16	0.9	39	1.2
Lymphoid tissue	C81 – C90	21	1.4	13	0.7	34	1
Secondary neoplasm of lymph node	C77	57	3.8	36	2.1	93	2.9
Brain, meninges & cranial nerves	C70 - C72	14	0.9	13	0.7	27	0.8

Table 3 is based on the ICD-10 classification, C02, C06 categories in oral cavity are the most common site for cancer. This area points to the gingival-buccal mucosa of the oral cavity. Breast and thyroid malignancies are

female predominant whereas all other malignancies are more prevalent among the male population. Colorectal cancers and oral cavity malignancies are near equal in both sexes although it is little more among the men.

Table 3: Number (n) and relative proportion (%) of cancers on various sites based on ICD 10 classification, reported from 2006 to 2022.

ICD 10 Code	ICD 10 Name	Number			%			
		F	М	Total	F	М	Total	
C00	Lip	24	40	64	1.37	2.64	1.96	
201	Base of Tongue	12	35	47	0.69	2.31	1.44	
202	Other areas Tongue	29	115	144	1.66	7.59	4.41	
203	Gum	19	44	63	1.09	2.9	1.93	
C04	Floor of Mouth	16	42	58	0.91	2.77	1.78	
C05	Palate	2	23	25	0.11	1.52	0.77	
206	Other & unspecified parts of mouth	118	227	345	6.74	14.98	10.56	
209	Tonsil	1	18	19	0.06	1.19	0.58	
210	Other Oropharynx	1	31	32	0.06	2.05	0.98	
211	Nasopharynx	4	8	12	0.23	0.53	0.37	
212	Pyriform sinus	2	12	14	0.11	0.79	0.43	
213	Hypopharynx	3	15	18	0.17	0.99	0.55	
214	Pharynx unspecified	2	15	17	0.11	0.99	0.52	
232	Larynx	6	63	69	0.34	4.16	2.11	
207	Parotid	2	9	11	0.11	0.59	0.34	
208	Other salivary glands	6	4	10	0.34	0.26	0.31	
215	Oesophagus	16	69	85	0.91	4.55	2.6	
216	Stomach	42	137	179	2.4	9.04	5.48	
217	Small Intestine	6	11	17	0.34	0.73	0.52	
218	Colon	35	42	77	2	2.77	2.36	
219	Recto sigmoid	1	2	3	0.06	0.13	0.09	
220	Rectum	40	45	85	2.28	2.97	2.6	
221	Anus & anal canal	7	14	21	0.4	0.92	0.64	
222	Liver	3	17	20	0.17	1.12	0.61	
223	Gallbladder	3	9	12	0.17	0.59	0.37	
224	Other biliarytract	0	0	0	0	0	0	
225	Pancreas	12	15	27	0.69	0.99	0.83	
230	Nasal cavity & middle ear	7	10	17	0.4	0.66	0.52	
31	Accessory sinuses	6	3	9	0.34	0.2	0.28	
33	Trachea	0	0	0	0	0	0	
234	Bronchus & lung	8	29	37	0.46	1.91	1.13	
240	Bone of limbs	2	3	5	0.11	0.2	0.15	
241	Bone of other areas	0	1	1	0	0.07	0.03	
243	Melanoma of skin	6	9	15	0.34	0.59	0.46	

C44Other skin741221964.238.056C45Mesothelioma00000000C46Kaposi Sarcona022000.130.06C47Peripheral nerves02200.310.050.31C48Retroperitoneum64100.340.260.313C49Soft tissues1019290.571.250.89C50Hreast561861434.041.191.88C51Vagina4050.271.6300.12C52Vagina40512.910.01.56C55Uterus mespecified0000000C56Orary etc620824.6802.51C57Uther smapecified0000000C56Pacenta00000000C57Other female genital00000000C56Prestare0141400.920.512.510.55C57Other male genital00000000C64Tests00000000C57Urinary bladder								
C46Kaposi Sarcoma0000000C47Peripheral nerves02200.130.06C48Retroperioneum64100.340.260.31C49Soft tissues1019290.5712.50.89C50Breast5961861434.41.918.8C51Vulva5050.2900.12C52Vagina4040.2300.12C53Cervix uteri287028716.3908.79C54Otyan yetc820824.6802.51C55Ubers unspecified000000C56Ovary etc820646404.221.96C57Other female genital0000000C61Prostate0141400.920.130.06C62Testis00000000C63Other male genital0000000C64Kidepert1726430.971.721.32C65Benal pelvis0000000C64Kidepert1120.660.070.66C65Ure	C44	Other skin	74	122	196	4.23	8.05	6
C47Peripheral nerves02200.130.061C48Retroperitoneum64100.340.260.31C49Soft tissues1019290.571.250.89C50Brasat5961861434.041.1918.83C50Whya505C.2900.12C52Vagina4040.2300.12C53Cervix uteri510512.9101.55C55Uterus unspecified000000C56Ovary etc820824.6802.221.96C57Other female genital0000000C58Placenta00000000C56Prostate0141400.920.430.06C61Prostate00000000C62Testis00000000C63Other male genital00000000C64Kidney etc612180.340.790.510.64C65Nereer000000000C66Mether genital0000	C45	Mesothelioma	0	0	0	0	0	0
C48Retropertoneum64100.340.260.31C49Soft tissues1019290.571.250.89C50Breast596186.1434.041.191.88C51Vulva5050.2900.15C52Vagina287028716.3908.79C54Corpus uteri510512.9101.56C55Uterus unspecified000000C56Ovary etc820824.6802.51C57Other female gental000000C56Pacenta0000000C57Other female gental000000C58Placenta012180.340.790.53C64Kidney etc012180.7400C64Uriter0000000C65Renal pelvis0000000C66Uriter00000000C66Uritary bladder1726430.971.721.32C68Mealinges96150.514.40.640C71Brain14812	C46	Kaposi Sarcoma	0	0	0	0	0	0
C49 Soft issues 10 19 29 0.57 1.25 0.89 C50 Breast 596 18 614 34.04 1.19 18.8 C51 Vulva 5 0 5 0.29 0 0.15 C52 Vagina 48 0 4 0.23 0 0.15 C53 Cervix uteri 287 0 6.1 2.91 0 0.55 Corpus uteri 51 0 0 0 0 0 0 C55 Uterus unspecified 0 0 0 0 0 0 0 C56 Ovary etc 82 0 82 4.68 0 4.22 1.06 C57 Other female genital 0 0 0 0 0 0 0 C60 Penis 0 0 0 0 0 0 0 C61 Prostate 0 0 0 0 0 0 0 C65 Renal pelvis	C47	Peripheral nerves	0	2	2	0	0.13	0.06
C50Preast5961861434.041.191.88C51Vulva5050.2900.15C52Vagina4040.2300.12C53Cervix uteri287028716.39087.99C54Corpus uteri510512.91015.6C55Utervs uspecified0000000C56Ovary etc820824.6802.51C57Other fenale genital0000000C60Penis0646404.221.96C61Prostate014140000C62Testis02200.130.0600C63Other male genital00000000C64Kidney etc612180.340.790.550C65Renal pelvis00000000C66Urster00000000C67Meninges1120.060.070.060C68Unspecified urinary organs0000000C71Frain48125.941.03	C48	Retroperitoneum	6	4	10	0.34	0.26	0.31
C51Vulva5050.2900.151C52Vagina4040.2300.12C53Cervix uteri287028716.3908.79C54Corpus uteri510512.9101.56C55Utrus unspecified000000C56Ovary etc820824.6800C57Other fenale genital000000C58Placenta0000000C60Penis0646404.221.96C61Prostate0141400.920.43C62Testis02200.130.66C63Renal penital000000C64Kidney etc612180.340.971.22C65Renal pelvis000000C66Ureter1120.660.070.66C70Meinges96150.510.410.46C71Brain48120.230.330.31C74Adrenal gland5160.290.070.38C75Other endocrine glands000000C74 <td>C49</td> <td>Soft tissues</td> <td>10</td> <td>19</td> <td>29</td> <td>0.57</td> <td>1.25</td> <td>0.89</td>	C49	Soft tissues	10	19	29	0.57	1.25	0.89
C52Vagina4040.2300.121C53Cervix uteri287028716.3908.79C54Corpus uteri510512.9101.56C55Uterus unspecified000000C56Ovary etc.820824.6802.51C57Other female genital000000C58Pacenta0646404.221.96C61Penis0646404.221.96C62Testis02200.130.66C63Other male genital000000C64Kidney etc.612180.340.790.51C65Renal pelvis0000000C66Ureter0000000C67Urinary bladler1726430.971.721.32C68Unspecified urinary organs000000C71Spinal cod, cranial nerves000000C73Thyroid104211255.941.393.83C74Adrenal gland5160.290.670.8C73Diber endocrine glands00	C50	Breast	596	18	614	34.04	1.19	18.8
C33 C vix uteri 287 0 287 16.39 0 8.79 C54 Corpus uteri 51 0 51 2.91 0 1.56 C55 Uterus unspecified 0 0 0 0 0 0 0 C56 Ovary etc 82 0 82 4.68 0 2.51 C57 Other female genital 0 0 0 0 0 0 0 C60 Pents 0 0 0 0 0 0 0 0 C61 Prostate 0 14 14 0 0.92 0.43 C62 Testis 0 2 2 0 0.13 0.66 C64 Kidney etc 6 12 18 0.34 0.79 0.53 C65 Renal pelvis 0 0 0 0 0 0 C66 Ureter 0	C51	Vulva	5	0	5	0.29	0	0.15
C54Corpus uteri510512.9101.56C55Uterus unspecified0000000C56Ovary etc820824.6802.51C57Other female genital000000C58Placenta000000C60Penis0646404.2210.61C61Prostate0141400.920.43C62Testis000000C63Other male genital000000C64Kidney etc612180.340.790.55C65Renal pelvis0000000C66Ureter0000000C67Urinsp bladder1726430.971.721.32C68Unspecified urinary organs0000000C70Meninges00000000C71Brain48120.230.530.370.36000C73Spinal cord, cranial nerves00000000000C73Spinal cordine glands000<	C52	Vagina	4	0	4	0.23	0	0.12
C55 Urers unspecified 0 0 0 0 0 0 0 2.51 C57 Other female genital 0 0 0 0 0 0 0 C58 Placenta 0 0 0 0 0 0 0 C60 Penis 0 64 64 0 4.22 1.96 C61 Prostate 0 14 14 0 0.92 0.43 C62 Testis 0 2 2 0 0.13 0.06 C63 Other male genital 0 0 0 0 0 0 0 C65 Renal pelvis 0 0 0 0 0 0 0 0 C66 Ureter 17 26 43 0.97 1.72 1.32 C66 Uretary bladder 17 26 43 0.97 0.63 0.73 C70 <td>C53</td> <td>Cervix uteri</td> <td>287</td> <td>0</td> <td>287</td> <td>16.39</td> <td>0</td> <td>8.79</td>	C53	Cervix uteri	287	0	287	16.39	0	8.79
C56Ovary etc820824.6802.51C57Other female genital000000C58Placenta0000000C60Penis0646404.221.96C61Prostate0141400.920.43C62Testis02200.130.06C63Other male genital000000C64Kidney etc612180.340.790.55C65Renal pelvis000000C66Ureter000000C67Urinary bladter1726430.971.721.32C68Unspecified urinary organs000000C70Keinal gand48120.630.740.63C71Brain48120.230.533.63C72Spinal cord, cranial nerves000000C73Thyroid104211255.941.393.83C74Adrenal gland5160.90.750.8C75Other endocrine glands0110.130.120.14C75Secondary neoplasm of simphnode3657	C54	Corpus uteri	51	0	51	2.91	0	1.56
C57Other female genital000000C58Placenta0000000C60Penis0646404.221.96C61Prostate0141400.920.43C62Testis02200.130.06C63Other male genital000000C64Kidney etc612180.340.790.55C65Renal pelvis0000000C66Ureter0000000C67Urinary bladder1726430.971.721.32C68Unspecified urinary organs000000C70Meninges96150.610.400C71Brain48120.230.530.63C73Thyroid104211255.941.393.83C74Adrenal gland5160.290.070.18C75Other endocrine glands01100.70.31C74Hodgkins disease22240.110.130.12C75Other endocrine gland01100.70.310.630.6C74Hod	C55	Uterus unspecified	0	0	0	0	0	0
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C60Penis0646404.221.96C61Prostate0141400.920.43C62Testis02200.130.06C63Other male genital000000C64Kidney etc612180.340.790.55C65Renal pelvis0000000C66Ureter0000000C67Urinary bladder1726430.971.721.32C68Unspecified urinary organs000000C70Meninges96150.510.40.44C71Brain48120.230.530.37C72Spinal cord, cranial nerves000000C73Thyroid104211255.941.393.83C74Adrenal gland5160.290.070.18C75Other endocrine glands000000C77Spicondary neoplasm of lymphone3657932.063.190.83C83Non-follicular lymphoma1118290.631.190.83C84Mature T/NK - cell lymphoma000000C85 <t< td=""><td>C57</td><td>Other female genital</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></t<>	C57	Other female genital	0	0	0	0	0	0
C61Prostate0141400.920.43C62Testis02200.130.06C63Other male genital000000C64Kidney etc612180.340.790.55C65Renal pelvis0000000C66Ureter000000C67Urinary bladder1726430.971.721.32C68Unspecified urinary organs000000C70Meninges96150.510.40.46C71Brain48120.230.530.37C72Spinal cord, cranial nerves000000C73Thyroid104211255.941.393.83C74Adrenal gland5160.290.070.18C75Other endocrine glands000000C76Secondary neoplasm of lymphnode3657932.063.762.85C81Hodgkins disease2240.110.130.120.84C82Follcular lymphoma118290.631.190.89C83Mon-follkular lymphoma000000C8	C58	Placenta	0	0	0	0	0	0
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C63Other male genital000000C64Kidney etc612180.340.790.55C65Renal pelvis000000C66Ureter000000C67Urinary bladder1726430.971.721.32C68Unspecified urinary organs000000C69Eye1120.060.070.06C70Meninges96150.510.40.46C71Brain48120.230.373.83C72Spinal cord, cranial nerves000000C73Thyroid104211255.941.393.83C74Adrenal gland5160.290.070.18C75Other endocrine glands000000C77Secondary neoplasm of lymphnode3657932.063.762.85C81Hodgkins disease2240.110.130.12C82Follicular lymphoma1118290.631.190.89C84Mature T/NK - cell lymphoma000000C85Other lymphomas0000000C84<	C61	Prostate	0	14	14	0	0.92	0.43
C64 Kidney etc. 6 12 18 0.34 0.79 0.55 C65 Renal pelvis 0 0 0 0 0 0 0 C66 Ureter 0 0 0 0 0 0 0 0 C66 Uriter 17 26 43 0.97 1.72 1.32 C68 Unspecified urinary organs 0 0 0 0 0 0 C69 Eye 1 1 2 0.06 0.07 0.06 C70 Meninges 9 6 15 0.51 0.4 0.46 C71 Brain 4 8 12 0.23 0.37 0.37 C72 Spinal cord, cranial nerves 0 0 0 0 0 0 C73 Thyroid 104 21 125 5.94 1.39 3.83 C74 Adrenal gland 5 <td< td=""><td>C62</td><td>Testis</td><td>0</td><td>2</td><td>2</td><td>0</td><td>0.13</td><td>0.06</td></td<>	C62	Testis	0	2	2	0	0.13	0.06
C65Renal pelvis000000C66Ureter000000C67Urinary bladder1726430.971.721.32C68Unspecified urinary organs000000C69Eye1120.060.070.06C70Meninges96150.510.40.46C71Brain48120.230.530.37C72Spinal cord, cranial nerves000000C73Thyroid104211255.941.393.83C74Adrenal gland5160.290.070.18C75Other endocrine glands000000C71Secondary neoplasm of Symphnode3657932.063.762.85C81Hodgkins disease2240.110.130.12C82Follicular lymphoma118290.631.190.89C83Non-follicular lymphoma000000C84Maliginn, prol D0000000C90Multiple myeloma0000000C91Lymphoid leukemia0000000 <td>C63</td> <td>Other male genital</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td>	C63	Other male genital	0	0	0	0	0	0
C66Ureter000000C67Urinary bladder1726430.971.721.32C68Unspecified urinary organs000000C69Eye1120.060.070.06C70Meninges96150.510.40.46C71Brain48120.230.530.37C72Spinal cord, cranial nerves000000C73Thyroid104211255.941.393.83C74Adrenal gland5160.290.070.18C75Other endocrine glands000000C71Secondary neoplasm of ymphnode3657932.063.762.85C81Hodgkins disease2240.110.130.12C82Follicular lymphoma1118290.631.190.89C83Non-follicular lymphoma000000C84Mature T/NK - cell lymphoma000000C83MaligImn. prol D0000000C90Multiple myeloma0000000C91Lymphoidelukemia0000000 <td>C64</td> <td>Kidney etc</td> <td>6</td> <td>12</td> <td>18</td> <td>0.34</td> <td>0.79</td> <td>0.55</td>	C64	Kidney etc	6	12	18	0.34	0.79	0.55
C67Urinary blader1726430.971.721.32C68Unspecified urinary organs000000C69Eye1120.060.070.06C70Meninges96150.510.40.46C71Brain48120.230.530.37C72Spinal cord, cranial nerves000000C73Thyroid104211255.941.393.83C74Adrenal gland5160.290.070.18C75Other endocrine glands000000C76Secondary neoplasm of ymphnode3657932.063.762.85C81Hodgkins disease2240.110.130.12C82Follicular lymphoma01100.070.03C83Non-follicular lymphoma1118290.631.190.89C84Mature T/NK - cell lymphoma0000000C85Other lymphomas00000000C90Multiple myeloma00000000C91Lymphoideleukemia00000000	C65	Renal pelvis	0	0	0	0	0	0
C68 Unspecified urinary organs 0 0 0 0 0 0 C69 Eye 1 1 2 0.06 0.07 0.06 C70 Meninges 9 6 15 0.51 0.4 0.46 C71 Brain 4 8 12 0.23 0.53 0.37 C72 Spinal cord, cranial nerves 0 0 0 0 0 0 C73 Thyroid 104 21 125 5.94 1.39 3.83 C74 Adrenal gland 5 1 6 0.29 0.07 0.18 C75 Other endocrine glands 0 0 0 0 0 0 0 C77 Secondary neoplasm of ymphnode 36 57 93 2.06 3.76 2.85 C81 Hodgkins disease 2 2 4 0.11 0.13 0.12 C82 Follicular lymphoma <	C66	Ureter	0	0	0	0	0	0
C69 Eye 1 1 2 0.06 0.07 0.06 C70 Meninges 9 6 15 0.51 0.4 0.46 C71 Brain 4 8 12 0.23 0.53 0.37 C72 Spinal cord, cranial nerves 0 0 0 0 0 0 C73 Thyroid 104 21 125 5.94 1.39 3.83 C74 Adrenal gland 5 1 6 0.29 0.07 0.18 C75 Other endocrine glands 0 0 0 0 0 0 C77 Secondary neoplasm of lymphnode 36 57 93 2.06 3.76 2.85 C81 Hodgkins disease 2 2 4 0.11 0.13 0.12 C82 Follicular lymphoma 11 18 29 0.63 1.19 0.89 C84 Mature T/NK - cell lymphoma 0<	C67	Urinary bladder	17	26	43	0.97	1.72	1.32
C70Meninges96150.510.40.46C71Brain48120.230.530.37C72Spinal cord, cranial nerves000000C73Thyroid104211255.941.393.83C74Adrenal gland5160.290.070.18C75Other endocrine glands000000C77Secondary neoplasm of lymphnode3657932.063.762.85C81Hodgkins disease2240.110.130.12C82Follicular lymphoma011000C83Non-follicular lymphoma000000C84Mature T/NK - cell lymphoma000000C88MaligInn. prol D0000000C90Lymphoid leukemia0000000	C68	Unspecified urinary organs	0	0	0	0	0	0
C71Brain48120.230.530.37C72Spinal cord, cranial nerves000000C73Thyroid104211255.941.393.83C74Adrenal gland5160.290.070.18C75Other endocrine glands000000C77Secondary neoplasm of lymphnode3657932.063.762.85C81Hodgkins disease2240.110.130.12C82Follicular lymphoma01100.070.03C83Non-follicular lymphoma000000C84Mature T/NK - cell lymphoma000000C88Malighm. prol D000000C90Multiple myeloma000000C91Lymphoid leukemia000000	C69	Eye	1	1	2	0.06	0.07	0.06
C72Spinal cord, cranial nerves000000C73Thyroid104211255.941.393.83C74Adrenal gland5160.290.070.18C75Other endocrine glands000000C77Secondary neoplasm of lymphnode3657932.063.762.85C81Hodgkins disease2240.110.130.12C82Follicular lymphoma01100.070.03C83Non-follicular lymphoma000000C84Mature T/NK - cell lymphoma000000C88MaligImn, prol D0000000C90Multiple myeloma0000000C91Lymphoid leukemia0000000	C70	Meninges	9	6	15	0.51	0.4	0.46
C73Thyroid104211255.941.393.83C74Adrenal gland5160.290.070.18C75Other endocrine glands000000C77Secondary neoplasm of lymphnode3657932.063.762.85C81Hodgkins disease2240.110.130.12C82Follicular lymphoma01100.070.03C83Non-follicular lymphoma1118290.631.190.89C84Mature T/NK - cell lymphoma000000C85Other lymphomas000000C86MaligImn. prol D000000C90Multiple myeloma000000C91Lymphoid leukemia000000	C71	Brain	4	8	12	0.23	0.53	0.37
C74Adrenal gland5160.290.070.18C75Other endocrine glands000000C77Secondary neoplasm of lymphnode3657932.063.762.85C81Hodgkins disease2240.110.130.12C82Follicular lymphoma01100.070.03C83Non-follicular lymphoma1118290.631.190.89C84Mature T/NK - cell lymphoma000000C85Other lymphomas0000000C86MaligImn. prol D0000000C90Lymphoid leukemia0000000	C72	Spinal cord, cranial nerves	0	0	0	0	0	0
C75Other endocrine glands000000C77Secondary neoplasm of lymphnode3657932.063.762.85C81Hodgkins disease2240.110.130.12C82Follicular lymphoma01100.070.03C83Non-follicular lymphoma1118290.631.190.89C84Mature T/NK - cell lymphoma000000C85Other lymphomas000000C88MaligImn. prol D000000C90Multiple myeloma000000C91Lymphoid leukemia0000000	C73	Thyroid	104	21	125	5.94	1.39	3.83
C77 Secondary neoplasm of lymphnode 36 57 93 2.06 3.76 2.85 C81 Hodgkins disease 2 2 4 0.11 0.13 0.12 C82 Follicular lymphoma 0 1 1 0 0.07 0.03 C83 Non-follicular lymphoma 11 18 29 0.63 1.19 0.89 C84 Mature T/NK - cell lymphoma 0 0 0 0 0 0 C85 Other lymphomas 0 0 0 0 0 0 0 C88 MaligImn. prol D 0 0 0 0 0 0 0 C90 Multiple myeloma 0 0 0 0 0 0 0	C74	Adrenal gland	5	1	6	0.29	0.07	0.18
Iymphnode I I 0.11 0.13 0.12 C81 Hodgkins disease 2 2 4 0.11 0.13 0.12 C82 Follicular lymphoma 0 1 1 0 0.07 0.03 C83 Non-follicular lymphoma 11 18 29 0.63 1.19 0.89 C84 Mature T/NK - cell lymphoma 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	C75	Other endocrine glands	0	0	0	0	0	0
C82Follicular lymphoma01100.070.03C83Non-follicular lymphoma1118290.631.190.89C84Mature T/NK - cell lymphoma000000C85Other lymphomas0000000C88MaligImn. prol D0000000C90Multiple myeloma0000000C91Lymphoid leukemia0000000	C77		36	57	93	2.06	3.76	2.85
C83 Non-follicular lymphoma 11 18 29 0.63 1.19 0.89 C84 Mature T/NK - cell lymphoma 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0<	C81	Hodgkins disease	2	2	4	0.11	0.13	0.12
C84 Mature T/NK - cell lymphoma 0 0 0 0 0 0 C85 Other lymphomas 0 0 0 0 0 0 0 0 C88 MaligImn. prol D 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	C82	Follicular lymphoma	0	1	1	0	0.07	0.03
C85Other lymphomas000000C88MaligImn. prol D0000000C90Multiple myeloma0000000C91Lymphoid leukemia0000000	C83	Non-follicular lymphoma	11	18	29	0.63	1.19	0.89
C88MaligImn. prol D000000C90Multiple myeloma000000C91Lymphoid leukemia000000	C84	Mature T/NK – cell lymphoma	0	0	0	0	0	0
C90Multiple myeloma000000C91Lymphoid leukemia000000	C85	Other lymphomas	0	0	0	0	0	0
C91 Lymphoid leukemia 0 0 0 0 0 0	C88	MaligImn. prol D	0	0	0	0	0	0
	C90	Multiple myeloma	0	0	0	0	0	0
Total 1751 1515 3266 100 100 100	C91	Lymphoid leukemia	0	0	0	0	0	0
	Total		1751	1515	3266	100	100	100

Table 4 shows that among the head and neck cancers, prevalence of carcinoma of mouth is more followed by tongue, oropharynx, larynx, lip, hypopharynx and nasopharynx. Figure 1 shows that all the head and neck cancers are male preponderant.

Table 4: Number (n) and relative proportion (%) of each site of cancers of head and neck relative to all sites of cancer reported
at the Department of Pathology, Kanyakumari Govt. Medical College, from 2006 to 2022.

Sites of cancer	Males	Females	Total		
(ICD – 10 code)	n	п	п	% (all sites)	
Lip (C00)	40	24	64	2	
Tongue (CO2)	115	29	144	4.4	
Mouth (CO3, CO4, CO6)	313	153	466	14.3	
Gum (CO3)	44	19	63	1.9	
Floor of mouth (CO4)	42	16	58	1.8	
Other and unspecified par of mouth (CO6)	227	118	345	10.6	
Oropharynx (C01, C05, C09, C10, C14)	122	18	140	4.3	
Base of tongue (C01)	35	12	47	1.4	
Palate (C05)	23	2	25	0.8	
Tonsil (C09)	18	1	19	0.6	
Oropharynx (C10)	31	1	32	1	
pharynx (C14)	15	2	17	0.5	
Nasopharynx (C11)	8	4	12	0.4	
Hypopharynx (C12-C13)	27	5	32	1	
Pyriform sinus (C12)	12	2	14	0.4	
Hypopharynx (C13)	15	3	18	0.6	
Larynx (C32)	63	6	69	2.1	
Cancers of head and neck	688	239	927	28.4	

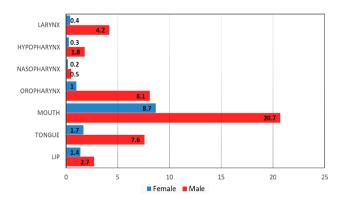


Figure 1: Relative proportion (%) of each site of cancers of head and neck relative to all sites of cancer reported at the Department of Pathology, Kanyakumari Govt. Medical College, from 2006 to 2022.

Discussion

The relative proportion of the reported cancer cases were 9.3%. This is slightly less compared to the prevalence in our neighbouring district Tirunelveli as stated in a study by Usha and Suresh Durai [3]. We found that the female cancers were more compared to the male cancers over the period of 2006 to 2022. In a research article by Hridhaya et al also shows more cancer prevalence among the female population [4]. This is owed to the major contribution from the breast cancer. Breast cancer represents 1 in 4 cancers diagnosed among women globally [5].

As compared to the GLOBOCON data, thyroid carcinomas were high among females. Colorectal carcinomas though little less compared to the male population, it is almost reaching to the sum which is also coinciding with the findings of GLOBOCON [6].

The top five leading cancers sites in female in descending order of frequency are Breast, uterine cervix, mouth, thyroid and ovary. Whilst in the surrounding districts are as follows: Tirunelveli: female breast followed by cervix, head and neck, GIT and thyroid in descending order. Thiruvanathapuram: Female cancers- breast >thyroid >ovary>uterine cervix>uterine corpus [7]. The most important finding is that breast carcinoma is at its peak among the female population,

The top five leading cancer sites in male in descending order of frequency are mouth, stomach, skin, tongue and larynx. Tirunelveli: head and neck followed by GIT, male genital tract, lymph node and urinary tract malignancies in descending order of frequency. Thiruvanathapuram: Lung>prostate> mouth>tongue>liver [7]. The findings are almost comparable to Tirunelveli district [7].

According to other studies like Mallath et al [4] Colorectal, lung, cervical, and thyroid cancers are also common among women. Lung cancer and prostate cancer are more among the men. A study by Binu et al says among males, 33.1% of all cancers were in the respiratory system followed by digestive organ cancers (23.2%). Among females, 28.4% cancers were related to the reproductive system, 22.8% to the respiratory system and 14.1% to digestive organs [8].

While going through the head and neck cancers particularly oral cancers involving the unspecified parts of mouth, floor of mouth and gums were at its lead when categorised according to various site and is more among the males.

Mouth cancers are more among the male population which is attributed to practices like betel nut, tobacco chewing, cigarette smoking and poor oral hygiene. This statement is upheld in a study by Mallath et al and it is also reported in the small taluks of Kanyakumari district since early 20th century as documented by the medical missionaries of Neyyoor Cancer Hospital [9]. It is more commonly seen among the lower socioeconomic group who were less informed about healthy practices and are the group of people who have to toil from dawn to dusk as labourer. This statement is supported by Behera and Patro in their research article. It states that the people can die due to cancer without access to health care in rural parts of the country due to lack of awareness about the cancers remains the key. Distance from appropriate health services and lower socioeconomic classes add more to it [9, 10].

Few studies by Hussain et al and Qazil et al also points that, among men, hypopharyngeal cancer, esophageal cancer, lung cancer, stomach cancer, and oral cancer were the major cancer types prevalent and, among females, cervical cancer, mouth cancer, breast cancer, ovary cancer, and thyroid cancer were the common cancer types [11, 12]. Significant prevalence of pharyngeal and laryngeal carcinoma is also noticed, whereas all other cancers were more among the male population. *Limitations:* The present study was based on a limited number of cases and provides only a single centre report. A multicentre approach will provide a conclusive data.

Conclusion

This study shows that the magnitude of cancer cases reported at Kanyakumari Government Medical College in the period between 2006 to 2022 is less compared to the nearby districts. Female breast cancers are at increasing trend. In male patients, oral cavity cancer predominates. This data could help to document, analyse and set a base for population-based cancer approach in and around Kanyakumari district.

Conflicts of interest

Authors declare no conflicts of interest.

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