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Research Article

Epidemiological Assessment of Carcinoma Types and Socio-Demographic Variables of Patients in Bangladesh

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Abstract

The present investigation was a cross-sectional descriptive study conducted to assess post-natal complications and their relationships with age group, residence, family income, and other socio-demographic characteristics among patients with carcinoma. A purposive sample of 280 respondents was selected. Most participants (about 80%) were between 25 and 50 years old, and 83.6% lived with their families. In terms of monthly income, 67.5% reported earning up to 15,000 BDT. The majority were married (67.14%), and males constituted 62% of the sample. Regarding religion, 90.36% were Muslims, followed by Hindus (4.29%) and Christians (5.36%). A large proportion (74.29%) resided in rural areas. Educationally, 55.36% had completed schooling from Class VI to XII. Employment status showed that 38.93% were engaged in some form of work, while 72.50% lived in joint families. Most respondents (61.1%) reported no family history of carcinoma. Disease-related data indicated that 38.18% were in the intermediate stage (Stage II or III), and 20.21% had been living with carcinoma for five years. Lifestyle factors showed that 77.77% had no history of tobacco use, and 87.11% did not consume alcohol. A notable association was found between education and carcinoma site: 13.19% of those educated up to Class VI–XII had colon cancer, and 27.77% were in the intermediate stage. Among participants over 50 years, 27.78% had colon cancer, while 38.18% of those aged 25–50 years were in the intermediate stage. Additionally, 61.1% of respondents without a family history suffered from oral cancer, whereas only 11.11% with such a history had prostate cancer. The relationship between family history and carcinoma site was statistically significant.

Keywords: Carcinoma, Breast carcinoma, Socio-demographic factors, Cancer in Bangladesh, Tobacco use, Treatment

INTRODUCTION

Cancer is a large group of diseases that can start in almost any organ or tissue of the body when abnormal cells grow uncontrollably, go beyond their usual boundaries to invade adjoining parts of the body and spread to other organs. The latter process is called metastasizing and is a major cause of death from cancer. A neoplasm and malignant tumor are other common names for cancer. Because metastatic BCC (mBCC) is uncommon, its incidence and disease course are poorly characterized [1]. Estimates of mBCC incidence vary widely, ranging from 0.0028% to 0.55% of all BCCs [2]. Metastatic BCC spreads by lymphatic and haematogenous routes [3]. For cases with lymph node metastases only, average survival is reported to be 3.6 years after metastatic diagnosis[2]. Among cases with haematogenous spread to sites such as bone, liver and lung, average survival is reported to be 8–14 months [4].

The incidence rates of UV-induced skin cancers, including basal cell carcinoma (BCC), are increasing worldwide and are becoming a major public health concern 9-12. Mortality rates associated with BCC are low (0.1%), but localized tissue invasion may induce considerable functional and cosmetic morbidity, especially because the majority of the lesions are located on the face [5, 6, 7]. Only few cancers registries record BCC, and in most cases only the first histologically confirmed BCC per patient is included [8]. This is mainly because of

the large number of tumors involved and its associated costs.

In general, BCCs are considered a disease of the elderly [9]. Cancer is the second leading cause of death globally, Lung, prostate, colorectal, stomach and liver cancer are the most common types of cancer in men, while breast, colorectal, lung, cervical and thyroid cancer are the most common among women. The cancer burden continues to grow globally, exerting tremendous physical, emotional and financial strain on individuals, families, communities and health systems. There has been growing recognition of the importance of asking patients in palliative care what matters to their quality of life, rather than relying on the preferences of clinicians and family members. Religious coping can be particularly compelling for disenfranchised populations, such as the elderly, minorities, and women, [10, 11] who often confront challenges in accessing health care [8].

More specifically, religious practices such as prayer and meditation can enhance a sense of control over stressful events16 by helping individuals achieve a personal relationship with a higher entity that offers strength and support to cope with their illness. Furthermore, religion provides a sense of purpose and meaning for seemingly incomprehensible events or chronic adversity [12, 13]. Religious belief systems can provide a framework for understanding the experience of death and dying [14].

Breast cancer is the most common cancer in women in the United States, with an estimate of 175,000 new cases a year [15] and constitutes a major source of medical and psychological morbidity. In addition to the impact of medical treatment, poor psychological adjustment to breast cancer can influence compliance with treatment, sexual functioning, social relationships, and quality of life [16, 17, 18, 19]. It has been estimated that up to 30% of women continue to have some disruption in quality of life one year after treatment for breast cancer [20, 21].

Women with ovarian cancer have the lowest overall survival rate among gynecologic cancer patients, partially because of difficulty in detecting this malignancy during its early stages [22]. Moreover, women with gynecologic cancers who sought instrumental social support had lower levels of interleukin-6 at the time of surgery as well as better clinical and functional status 1 year after diagnosis. Interleukin-6 (IL-6) is a proinflammatory cytokine produced by several sources including endothelial cells, macrophages, and ovarian tumor cells [23, 24]. IL-6 is low to undetectable in healthy individuals but becomes less tightly regulated with age, and peripheral blood levels increase [25].

In addition, we investigated whether there were any associations between the individual dimensions of the mental adjustment to cancer (MAC) scale and overall or event-free survival, and similarly for the Courtauld emotional control (CEC) scale. Women were followed up for a minimum of 5 years. Non melanoma skin cancer (NMSC) is the most common malignancy in the United States, with substantial associated morbidity and cost, as well as relatively small but significant mortality [26]. Many health systems in low- and middle-income countries are least prepared to manage this burden, and large numbers of cancer patients globally do not have access to timely quality diagnosis and treatment [27].

In many countries where health systems are strong, survival rates of many types of cancers are improving thanks to accessible early detection, quality treatment and survivorship care. This study showed us the types of carcinomas and their relationship socio-demographic condition. It helps us to identify their problem and condition. Also give an idea about how to treat and prevent the carcinoma. The present study was aimed to determine the types of carcinomas of the patients and their socio-demographic characteristics (e.g; age, gender, income, education level) of patients.

MATERIALS AND METHODS

Type of study

This was a cross-sectional type of descriptive study.

Place of study

All the patients with carcinoma attending Khwaja Yunus Ali Medical College Hospital, Sirajgang, Bangladesh. The study was carried out at Varendra University and Varendra Institute of Biosciences, Affiliated with the University of Rajshahi.

Sample size

The sample size of this study 280.

Determination of sample size

The sample size was determined by using the following formula:

$$\text{Sample size, } n = (z^2 x pq)/(d^2)$$

Where, p = Response distribution i.e, the proportion of factor in the population or the expected frequency value, q = 1 – p, d = Margin of error is the amount of error that one would tolerate.

Z = Are under normal curve corresponding to the desired confidence level (CI) and it is the amount of uncertainty that one can tolerate.

So,

$$n = [(1.98)^2 \times (0.23)\ (0.77)] / ((0.05)^2) = 278.48$$

So, the total sample size taken for this study was 280.

Data collection instruments

A partially structured questionnaire which was duly pre-tested was used to collect data from the respondents.

Data collection procedure

The data was collected form the carcinoma patients attending Khwaja Yunus Ali Medical College Hospital, Sirajgang, Bangladesh, through face-to-face interviews through a partially structured questionnaire all efforts were made to collect data accurately. For open questions, the respondents were asked in such a manner so that they could speak freely and explain their opinion in a normal and neutral way. No leading questions were asked.

Inclusion criteria of the respondents

Carcinoma patients attending Khwaja Yunus Ali Medical College Hospital, Sirajgang who came for treatment purpose.

Statistical Analysis

All data were arranged in Microsoft Excel data calculation and analyses were conducted using SPSS version 26.0 (SPSS Inc., USA). Documentation of differences between the treatments were performed using a one-way analysis of variance (ANOVA). In cases where significant differences were found ($P \leq 0.05$).

Ethical consideration

Prior to the commencement of the study, the research protocol was approved by the research committee of Varendra University. Then it was assured that all information and records would be kept confidential and would be used only for research purposes and the findings would be helpful in finding the relationship between complications of the carcinoma of the patients with their socio-demographic characteristics and might be the basis for further in-depth study.

RESULTS

The present study was performed on 280 number of patients in response to 80% were in the age group 25-50 years, 12.5% were in less than 25 years group and 7.5% were in >50 years age group. It was found that most (62%) of the respondent were male any only 38% were female (Table 1). From the collection of patient sample 90.36% of the respondents were Muslims, 4.29% were Hindu and 5.36% were Christian. In case of educational level highest value found from Class VI-XII 55.36% and 16.43% Graduate and Above, 16.79 % were in Class I-V and Illiterate range 11.43% respectively (Table 01). From the category of job holder 38.93% were employed, 22.14% were unemployed and minimal 11.07% were doing other job. Regarding to the income sources, it was found that the maximum monthly income ranging from 67.5% up to 15000 BDT, 26.4% were income monthly 15001- 30000 BDT and 6.1% were income monthly above 30 thousand respectively. The maximum sufferings of carcinoma those who are belonging from joint family (72.50%) and 27.50% were live in nuclear family. From the religion fact in this study the maximum level of patient were found in Muslims (90.36%), which is followed by Christian (5.36%) and 4.29% were Hindu. It was found that majorities (74.29%) of the respondents were rural and (25.71%) were urban. From the patient history most of them are married 67.14% and 13.94% were unmarried rest of them were Widow 18.92% respectively (Table 01).

From this study the management and clinical properties of family history of carcinoma it was found that the highest level is 61.1% and had no family history of carcinoma, 27.50% had family history of carcinoma (Table 02). It was found that out of 280 respondents, majority 27.78% had history of colon carcinoma, 22.22% had history of lung carcinoma and 5.55% had history of others carcinoma. Regarding stage or severity of carcinoma distribution of the respondents, majority 55.71% duration of carcinoma 2-5 years, 31.07% duration of carcinoma <1 years and minimal 13.21% duration of carcinoma >5 years (Table 02). Similarly, the severity of carcinoma distribution of the respondents, most of them (38.18%) were in intermediate stage (Stage II or III), 17.36% were unknown stage, 20.08% were in early stage (Stage 0 or I) and 24.36% were in advanced stage (Stage IV). From the present study previously mentioned patient's information most of them were faced the different side effect of carcinoma treatment (73.82%). It was found that 74.55% have the ability to perform physical activities, 25.45% had no ability to perform physical activities. It faced difficulties in accessing healthcare services or cancer screenings approximately 72.24% have faced difficulties and only 27.76% have no difficulties in accessing healthcare services or cancer screenings (Table 02). From the distribution of the respondents regarding alcohol user, it was found that out of 280 respondents, most of them have no history of alcohol drinking (87.11%) and 12.53% were drunk alcohol (Figure 1).

Regarding tobacco smoking habit it was found that 77.77% had no history of tobacco smoking habit but 22.23% were tobacco smoker (Figure 02).

The patients severe with carcinoma and received treatment, like: surgery, chemotherapy, radiotherapy and immunotherapy. Maximum (39.39%) patients received chemotherapy, 26.91% received radiation therapy and rest of them (16.16% %) received immunotherapy (Figure 03).

Table 1: Characteristics category of patient severe with carcinoma

Characteristics		Mean Number of Response Out of (280)	Percentage (%)	p-Value
Age	Less than 25	35	12.5 %	0.145
	25 to 50	224	80 %	
	More than 50	21	7.5 %	
Gender	Male	107	62 %	0.073
	Female	173	38 %	
Educational level	Class I-V	47	16.79 %	0.046
	Class VI-XII	155	55.36 %	
	Graduate>	46	16.43 %	

	Illiterate	32	11.43 %	
Employment status	Employed	109	38.93 %	0.008
	Unemployed	62	22.14 %	
	Retired	46	16.43 %	
	Business	32	11.43 %	
	Other	31	11.07 %	
Income	Up to 15000 BDT	189	67.5 %	0.104
	15001- 30000 BDT	74	26.4 %	
	> 30000 BDT	17	6.1 %	
Family Type	Nuclear	77	27.50 %	0.135
	Joint	203	72.50 %	
Religion	Muslims	253	90.36 %	0.182
	Hindu	12	4.29 %	
	Christian	15	5.36 %	
Residence	Outside Home	46	16.4 %	0.188
	With Family	234	83.6 %	
Marital Status	Married	188	67.14 %	0.095
	Unmarried	39	13.94 %	
	Widow	53	18.92 %	

Table 2: Management and clinical status

Characteristics		Mean Number of Response Out of (280)	Percentage (%)	p-Value
Family History of Carcinoma	Yes	109	38.9%	0.069
	No	171	61.1%	
Site of Carcinoma	Breast	47	16.67%	0.002
	Lung	62	22.22%	
	Prostate	31	11.11%	
	Colon	78	27.78%	
	Oral	47	16.67%	
	Other	15	5.55%	
Duration of Carcinoma	<1 years	87	31.07%	0.057
	2-5 years	156	55.71%	
	>5 years	37	13.21%	
Severity of Carcinoma	Early Stage (Stage 0 or I)	56	20.08%	0.006
	Intermediate Stage (Stage II or III)	107	38.18%	
	Advanced Stage (Stage IV)	68	24.36%	
	Don ‘t Know	49	17.36%	
Side Effect of Treatment	Yes	207	73.82%	0.128
	No	48	17.01%	
	Don ‘t knows	25	9.17	
Perform Physical Exercise	Yes	209	74.55%	0.146
	No	71	25.45%	
Difficulties in cancer screening	Yes	202	72.24%	0.133
	No	78	27.76%	

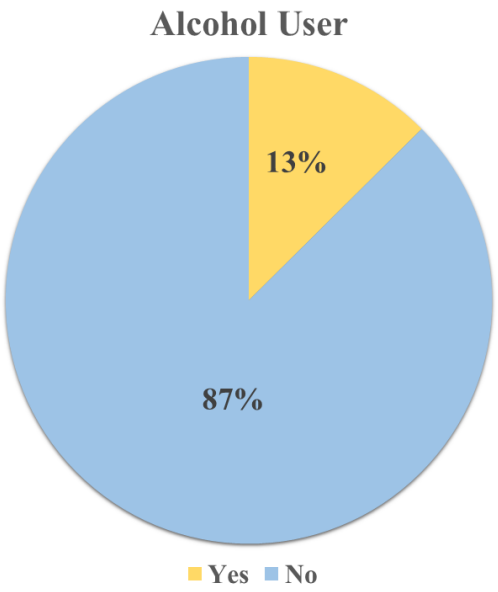

Figure 3: Distribution of respondents of patients on alcohol consumption.

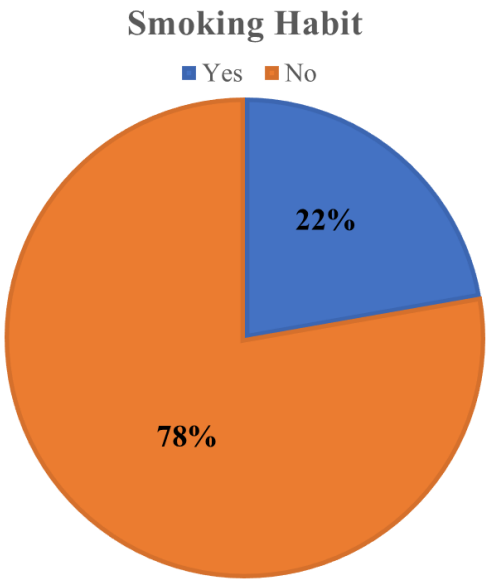

Figure 2: Distribution of respondents of patients on smoking habit.

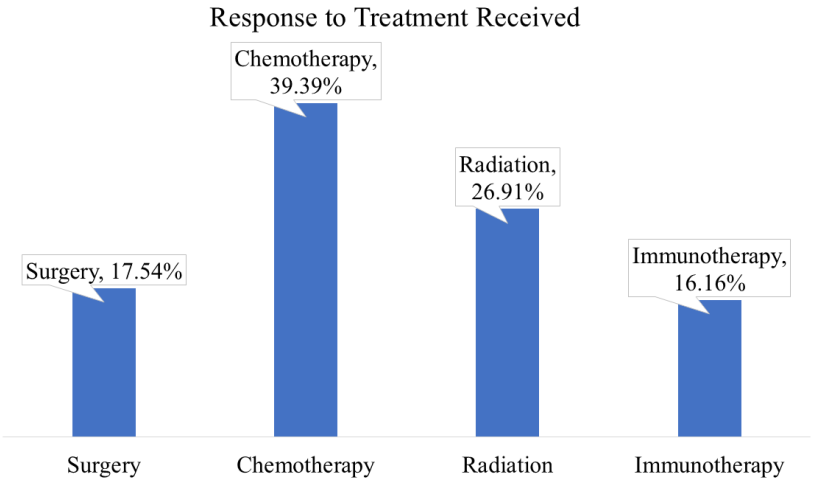

Figure 3: Distribution of respondents of patients received treatments surgery, chemotherapy, radiotherapy and immunotherapy.

DISCUSSION

A study was conducted and published [28] from January 1981 through October 2011 on investigating post-natal complication among 172 mBCC cases published that met initial evaluation criteria, 100 cases with clear survival information after metastatic diagnosis were included in the analysis. Sixty cases were reported from North America, 20 from Europe, 10 from Asia, seven from Australia and New Zealand, two from Africa and one from South America. Among 50 cases for whom race was reported, 43 (86%) were Caucasian. Among seven cases with both mBCC and Gorlin syndrome identified during this time period; one had sufficient survival information to be included in this analysis. The characteristics for the 100 mBCC cases by site of disease spread. Nine cases had metastases to more than two locations. Among RM cases, one had spread to three sites (auditory meatus, oral cavity and subcutaneous neck) [29]. From our study age distribution of the respondents, highest 80% were in the age group 25-50 years, 12.5 were in Less than 25 years group and 7.5% were in >50 years age group [30].

From this study residential status distribution of the respondents, it was found that, majority 83.6% respondents live with family, and 16.4% respondents live outside home. On another study we found that 87% respondents live with Family, and 13% respondents live outside home [31].

In many cases family income also effects certain types of disease, in our study it was found that majority 67.5% were income monthly up to 15000 BDT, 26.4% were income monthly 15001- 30000 BDT and 6.1% were income monthly >30 thousand also found that out of 280 respondents, majority 67.14% were married, 18.92% were Widow and 13.94% were Unmarried. On another

study similarly found that based on population sample 86% were married, 7% were Widow and 7% were unmarried [27].

From our study it was found that most (62%) of the respondent were male any only 38% were female. Also, in case of religion fact significantly highest level was in Muslim which is followed by Christian and Hindu. It was found that majorities (74.29%) of the respondents were rural and (25.71%) were urban. A sensitivity analysis that used time from lymph node metastasis instead of time from distant metastasis four cases with this information showed no impact on median survival, which remained at 24 months for distant metastasis. In this sensitivity analysis, the 1- year survival probability for DM cases was slightly higher at 63.1% (95% CI, 49.5–76.7%), but remained significantly shorter than for RM cases (P = 0.0011). Additional survival estimates were performed to determine whether other factors were related to mBCC survival time [32].

The education level distribution of the respondents, it was found that majority 55.36% were in the education level of Class VI-XII and 16.43% graduate and above, 16.79 % were in class I-V and 11.43% were illiterate. Also found from a study it was 55.36% in the Class VI-XII and 16.43% graduate and above, 16.79 % were in Class I-V and 11.43% were illiterate [33, 34, 35].

From our study most of them are employed (38.93%) as well as majority (72.50%) were live in joint family and 27.50% were live in nuclear family. Among them majority 61.1% had no family history of carcinoma, 27.50% had family history of carcinoma. Most of them suffering with (27.78%) colon carcinoma, (22.22%) had history of lung carcinoma and (5.55) had history of others carcinoma. In another one we saw 28% had history of colon carcinoma, 25% had history of lung carcinoma and 7% had history of other carcinoma [36].

The significantly enhanced in case of intermediate stages 38.18% (Stage II or III) followed by 17.36% were unknown stage, 20.08% were in early stage (Stage 0 or I) and 24.36% were in advanced stage (Stage IV). Regarding stage or severity of carcinoma distribution of the respondents, the maximum 20.21% duration of carcinoma in 5 years, 8.26% duration of carcinoma in 4 years and minimal 1.96% duration of carcinoma in 12 years. It was also found that most of them 39.39% received chemotherapy, 26.91% received radiation therapy and minimal 16.16% % receive immunotherapy. It was also reported that 42% receive chemotherapy, 24% received radiation therapy and minimal 18% receive immunotherapy [37].

Besides the side effect of treatment distribution of the respondents, maximum 73.82% had side effect of treatment, 17.01% had no side effect of treatment and minimal 9.17% respondents don 't knows about side effect. In our study the effectiveness of tobacco smoker from our patient sample 77.77% had non tobacco smoker, 22.23% had history of smoking habit similarly 87.11% were not alcohol drunk patients 12.53% were of alcohol uses. Physical exercise may also keep our body fit and mentally active for many diseases. Physically active persons who are suffering from carcinoma maximum range were reported 74.55% and 25.45% were ability to perform normal physical activities and also reported by [38] 75% had ability to perform physical activities, 25% had no ability to perform physical activities.

It was found that majority 72.24% had difficulties in accessing healthcare services or cancer screenings, 27.76% only had no difficulties in accessing healthcare services or cancer screenings and also reported that 13.19% of the respondent whose education level between secondary & higher secondary (class 6-12) are highly face problem colon cancer. On the other hand, only 1% respondent are facing lung carcinoma whose education level graduate plus. Also average 6% respondent face prostate carcinoma whose education level primary (class 1-5) also 11% respondent face breast carcinoma whose education level primary (class 1-5). And average 14% respondent face breast carcinoma whose education level graduate plus as 2% face breast carcinoma whose education level primary (class 1-5) [39].

Above table showed the relationship between education level of the respondents and severity of carcinoma. About majority 27.77% of the respondent whose education level between secondary & higher secondary (class 6- 12) were in intermediate stage (Stage II or III). On the other hand, only 1.97% respondents were in advanced stage (stage iv) whose education level primary (class 1-5). Also average 10.23% were in I early stage (Stage 0 or I) who was illiterate. The relationship between education level of the respondents and severity of carcinoma was found statistically significant. And also reported by [40] that 27.77% of the respondent whose education level between secondary & higher secondary (Class 6-12) were in intermediate stage (Stage II or III). On the other hand, only 1.97% respondents were in advanced stage (stage iv) whose education level primary (class 1-5). Also average 10.23% were in I early stage (stage 0 or I) who was illiterate [41].

On the other hand, only 3% respondents were in Advanced Stage (Stage IV) whose age < 25 years Also average 16% were in Intermediate Stage (Stage II or III) whose age between >50 years [19, 42,43,44].

In case of family history of carcinoma of the respondents and site of carcinoma. The maximum level (24.01%) of the respondent who have no family history of carcinoma are highly face problem oral cancer. On the other hand, only 0.60% of the respondent who have family history of carcinoma are highly face problem Prostate cancer. Also average 12.80% of the respondent who have family history of carcinoma are highly face problem breast cancer also 10.16% respondent face lung carcinoma who have family history of carcinoma. However, the lifetime BCC risk for men was approximately 1 in 5 (21%) and for women it was 1 in 6 (18%) [45]. And average 9.66% respondent face breast carcinoma who have family history of carcinoma. The relationship between family history of carcinoma of the respondents and site of carcinoma was found statistically significant.

Author contributions: MK and MRH conceived and developed the concept of the study. The conception and

design of this research were made by MK, MRH, KH, SM, BP, EAM and SK. MK and EAM wrote the draft of the manuscript. MK, SM & SK analyzed the data. The review of the manuscript was performed by MK, MRH, KH, SM, EAM, HR and SK. All authors read and revised the article, HR and SK approved the final manuscript and hence worked as a corresponding author. Investigations and writing-original draft preparation, MK, HR, SK; Data analysis, article writing, reviewing and supervision.

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REFERENCES

1. Watson M, Wichmann M, Ganguly T. Cutaneous basal cell carcinoma requiring limb amputation. ANZ J Surg. 2019;89(12). https://doi.org/10.1111/ans.14971

2. Wadhera A, Fazio M, Bricca G, Stanton O. Metastatic basal cell carcinoma: a case report and literature review. Dermatol Online J. 2006;12(5). https://doi.org/10.5070/D313V4J8VJ

3. Lo JS, Snow SN, Reizner GT, Mohs FE, Larson PO, Hruza GJ. Metastatic basal cell carcinoma: report of twelve cases with a review of the literature. J Am Acad Dermatol. 1991;24(5):715-9. https://doi.org/10.1016/0190-9622(91)70108-E PMid:1869642

4. Domarus HV, Stevens PJ. Metastatic basal cell carcinoma: report of five cases and review of 170 cases. J Am Acad Dermatol. 1984;10(6):1043-60. https://doi.org/10.1016/S0190-9622(84)80334-5 PMid:6736323

5. Hannuksela-Svahn A, Pukkala E, Karvonen J. Basal cell skin carcinoma and other nonmelanoma skin cancers in Finland, 1956-1995. Arch Dermatol. 1999;135(7):781-6. https://doi.org/10.1001/archderm.135.7.781 PMid:10411152

6. Lewis KG, Weinstock MA. Trends in nonmelanoma skin cancer mortality in the United States, 1969-2000. J Invest Dermatol. 2007;127(10):2323-7. https://doi.org/10.1038/sj.jid.5700897 PMid:17522705

7. Jensen AØ, Bautz A, Olesen AB, Karagas MR, Sørensen HT, Friis S. Mortality in Danish patients with nonmelanoma skin cancer, 1978-2001. Br J Dermatol. 2008;159(2):419-25.

8. Flohil S. Basal cell carcinoma in the Netherlands. Rotterdam: Erasmus University Rotterdam; 2012.

9. Karagas MR, Greenberg ER, Spencer SK, Stukel TA, Mott LA. Increase in incidence of basal and squamous cell skin cancer in New Hampshire. Int J Cancer. 1999;81(4):555-9. https://doi.org/10.1002/(SICI)1097-0215(19990517)81:4<555::AID-IJC9>3.0.CO;2-R

10. Krause N. Church-based social support and health in old age. J Gerontol B Psychol Sci Soc Sci. 2002;57(6):S332-7. https://doi.org/10.1093/geronb/57.6.S332 PMid:12426442

11. Tarakeshwar N, Hansen N, Kochman A, Sikkema KJ. Gender, ethnicity and spiritual coping among bereaved HIV-positive individuals. Ment Health Relig Cult. 2005;8(2):109-25. https://doi.org/10.1080/1367467042000240383

12. Taylor EJ. Factors associated with meaning in life among people with recurrent cancer. Oncol Nurs Forum. 1993;20(9):1399-405.

13. Thomas J, Retsas A. Spiritual dimensions of people with terminal cancer: a grounded theory. Int J Nurs Stud. 1999;36(3):191-201. https://doi.org/10.1016/S0020-7489(99)00012-7 PMid:10404288

14. Daaleman TP, VandeCreek L. Placing religion and spirituality in end-of-life care. JAMA. 2000;284(19):2514-7. https://doi.org/10.1001/jama.284.19.2514 PMid:11074785

15. Bernstein L, Allen M, Anton-Culver H, Deapen D, Horn-Ross PL, Peel D, et al. High breast cancer incidence among California teachers. Cancer Causes Control. 2002;13(7):625-35. https://doi.org/10.1023/A:1019552126105 PMid:12296510

16. Greer S, Morris T, Pettingale KW. Psychological response to breast cancer: effect on outcome. Lancet. 1979;314(8146):785-7. https://doi.org/10.1016/S0140-6736(79)92127-5 PMid:90871

17. Levine EG, Raczynski JM, Carpenter JT. Psychological factors, weight gain and recurrence of breast cancer: follow-up findings. In: Second International Congress of Behavioral Medicine; July 1992.

18. Levy SM. Behavior and Cancer. San Francisco: Jossey-Bass; 1985.

19. Levy SM, Lee J, Bagley C, Lippman M. Survival hazards in first recurrent breast cancer: seven-year follow-up. Biopsychosoc Med. 1988;50(5):520-8. https://doi.org/10.1097/00006842-198809000-00008 PMid:3186895

20. Glanz K, Lerman C. Psychosocial impact of breast cancer: a critical review. Ann Behav Med. 1992;14(3):204-12. https://doi.org/10.1093/abm/14.3.204

21. Irvine D, Brown B, Crooks D, Roberts J, Browne G. Psychosocial adjustment in women with breast cancer. Cancer. 1991;67(4):1097-107. https://doi.org/10.1002/1097-0142(19910215)67:4<1097::AID-CNCR2820670438>3.0.CO;2-Z PMid:1991258

22. Fleming GF, Ronnett BM, Seidman J, Zaino RJ, Rubin SC. Epithelial ovarian cancer. In: Principles and Practice of Gynecologic Oncology. 2009. p. 763-836.

23. Van Snick J. Interleukin-6: an overview. Annu Rev Immunol. 1990; 8:253-78. https://doi.org/10.1146/annurev.iy.08.040190.001345 PMid:2188664

24. Watson JM, Sensintaffar JL, Berek JS, Martínez-Maza O. Constitutive interleukin-6 production by ovarian cancer cells. Cancer Res. 1990;50(21):6959-65.

25. Ershler WB. Interleukin-6: a cytokine for gerontologists. J Am Geriatr Soc. 1993;41(2):176-81. https://doi.org/10.1111/j.1532-5415.1993.tb02054.x PMid:8426042

26. Karimkhani C, Boyers LN, Dellavalle RP, Weinstock MA. Time to replace "nonmelanoma skin cancer" with "keratinocyte carcinoma." J Am Acad Dermatol. 2015;72(1):186-7. https://doi.org/10.1016/j.jaad.2014.09.036 PMid:25497921

27. Lutgendorf SK, Garand L, Buckwalter KC, Reimer TT, Hong SY, Lubaroff DM. Stress, mood, and elevated IL-6 in older women. J Gerontol A Biol Sci Med Sci. 1999;54(9):M434-9. https://doi.org/10.1093/gerona/54.9.M434 PMid:10536645 PMCid:PMC6642656

28. Ilnyckyj A, Farber J, Cheang M, Weinerman BH. Psychotherapeutic intervention in cancer patients: a randomized trial. Ann R Coll Physicians Surg Can. 1994;27(2):93-6.

29. Epstein AM. Health care in America-still too separate, not yet equal. N Engl J Med. 2004;351(6):603-5. https://doi.org/10.1056/NEJMe048181 PMid:15295055

30. Weisman AD, Worden JW. Coping and vulnerability in cancer patients. Project Omega. Harvard Medical School; 1977.

31. Zhou D, Kusnecov AW, Shurin MR, DePaoli ME, Rabin BS. Stressors elevate plasma interleukin-6. Endocrinology. 1993;133(6):2523-30. https://doi.org/10.1210/endo.133.6.8243274 PMid:8243274

32. Lutgendorf SK, Anderson B, Sorosky JI, Buller RE, Lubaroff DM. Interleukin-6 and social support in gynecologic cancer. Int J Behav Med. 2000;7(2):127-42. https://doi.org/10.1207/S15327558IJBM0702_3

33. Kiecolt-Glaser JK, Preacher KJ, MacCallum RC, Atkinson C, Malarkey WB, Glaser R. Chronic stress and IL-6 increase with age. Proc Natl Acad Sci USA. 2003;100(15):9090-5.

https://doi.org/10.1073/pnas.1531903100 PMid:12840146 PMCid:PMC166443

34. Maes M, Lin AH, Delmeire L, Van Gastel A, Kenis G, De Jongh R, et al. Elevated IL-6 and IL-6 receptor in PTSD. Biol Psychiatry. 1999;45(7):833-9. https://doi.org/10.1016/S0006-3223(98)00131-0 PMid:10202570

35. Dentino AN, Pieper CF, Rao KMK, Currie MS, Harris T, Blazer DG, et al. IL-6 and depression in older adults. J Am Geriatr Soc. 1999;47(1):6-11. https://doi.org/10.1111/j.1532-5415.1999.tb01894.x PMid:9920223

36. Ferrucci L, Harris TB, Guralnik JM, Tracy RP, Corti MC, Cohen HJ, et al. IL-6 and disability development in old age. J Am Geriatr Soc. 1999;47(6):639-46. https://doi.org/10.1111/j.1532-5415.1999.tb01583.x PMid:10366160

37. Cohen HJ, Pieper CF, Harris T, Rao KMK, Currie MS. IL-6 and functional disability in the elderly. J Gerontol A Biol Sci Med Sci. 1997;52(4):M201-8. https://doi.org/10.1093/gerona/52A.4.M201 PMid:9224431

38. Taaffe DR, Harris TB, Ferrucci L, Rowe J, Seeman TE. IL-6, CRP and physical performance in aging. J Gerontol A Biol Sci Med Sci. 2000;55(12):M709-15. https://doi.org/10.1093/gerona/55.12.M709 PMid:11129392

39. Ershler WB, Keller ET. IL-6, aging, disease, and frailty. Annu Rev Med. 2000; 51:245-70. https://doi.org/10.1146/annurev.med.51.1.245 PMid:10774463

40. Holloszy JO, Cannon JG. Cytokines in aging and muscle homeostasis. J Gerontol A Biol Sci Med Sci. 1995;50(Spec Iss):120-3. https://doi.org/10.1093/gerona/50A.Special_Issue.120 PMid:7493204

41. Burger RA, Grosen EA, Ioli GR, Van Eden ME, Park M, Berman ML, et al. IL-6 release by ovarian carcinoma cell populations. J Interferon Cytokine Res. 1995;15(3):255-60. https://doi.org/10.1089/jir.1995.15.255 PMid:7584672

42. Plante M, Rubin SC, Wong GY, Federici MG, Finstad CL, Gastl GA. Serum and ascites IL-6 as a prognostic factor in ovarian cancer. Cancer. 1994;73(7):1882-8. https://doi.org/10.1002/1097-0142(19940401)73:7<1882::AID-CNCR2820730718>3.0.CO;2-R PMid:8137215

43. Holland JC, Korzun AH, Tross S, Cella DF, Norton L, Wood W. Psychosocial factors and disease-free survival in stage II breast cancer. Proc Am Soc Clin Oncol. 1986; 5:237.

44. Jamison RN, Burish TG, Wallston KA. Psychogenic factors predicting breast cancer survival. J Clin Oncol. 1987;5(5):768-72. https://doi.org/10.1200/JCO.1987.5.5.768 PMid:3572466

45. Buddeberg C, Wolf C, Sieber M, Riehl-Emde A, Bergant A, Steiner R, et al. Coping strategies and course of breast cancer: 3-year study. Psychother Psychosom. 1991;55(2-4):151-7. https://doi.org/10.1159/000288423 PMid:1891562