



EXPENDITURE ON ADULT CANCER PATIENTS WITH SPECIAL REFERENCE TO 'GENDER' – A STUDY AT REGIONAL CANCER HOSPITAL

Dr. Mangesh Sidhewad¹, Dr. S.P Andurkar²,

¹ Intern, Government Medical College, Aurangabad, Maharashtra, India.

² Associate Prof, Dept. of Community Medicine, Government Medical College,
Aurangabad, Maharashtra, India.

Abstract:

Background: Worldwide, around 1 million individuals develop cancer each year; this figure is expected to increase to 15 million in 2020. India has cancer related deaths around 7, 84,821, of which males are 9.81%, females 9.42%, Study in India show that if a patient is female, 73 % of the overall difference in cumulative expenditures [₹ 32,446 (PPP\$12978)] is explained by gender difference in expenditures among patients suffering from common cancers. This gender differences, among common cancers vary by different demographic and economic characteristics. So, the present study is planned to study presence, magnitude and determinants of the expenditure differences with reference to gender.

Objective:

1. To study the presence and magnitude of the expenditure differences
2. To study the factors associated with expenditure inequality with Reference to gender on adult cancer patients.
3. To calculate the average expenditure of female cancer patients

Materials and Methods: The present community based cross sectional study is carried out in regional cancer hospital with objectives of studying to study the presence and magnitude of the expenditure differences, to study the factors associated with expenditure inequality, to calculate the average expenditure of female cancer patients with reference to gender with the help of predesigned questionnaire, we assessed socio-demographic data. (chi square, ANOVA, Tukey Post Hoc, t test was applied wherever required. P <0.05 was considered as statistically significant.

Results: There is significant "gender" discrimination seen with total expenditure and at various levels of treatment (like IPD, OPD, Medical, Non-medical etc) in terms of expenditure.

Keywords: Gender, expenditure differences, adults, cancer

INTRODUCTION:

Worldwide, around 1 million individuals develop cancer each year; this figure is expected to increase to 15 million in 2020. India has cancer related deaths around 7, 84,821, of which males are 9.81%, females 9.42%¹. This gender differences, among common cancers vary by different demographic and economic characteristics²

Cancer treatment is quite expensive in all hospitals and for almost 41% of the patient's treatment cost was unaffordable³. Study in India show that if a patient is female, the mean cumulative expenditure is less by ₹. 23,698 (PPP \$ 9479), therefore, 73 % of the overall difference in cumulative expenditures [₹ 32,446 (PPP\$12978)] is explained by gender difference in expenditures among patients suffering from common cancers⁴. According to Gender Inequality Index (GII) United Nations, India ranks 132th among 187 countries, lagging far behind its regional neighbors⁵ and 108th in Gender Gap Index⁶. Sustainable Development Goal-5 aims to promote Gender equality and empower women, with specific focus on eliminating barriers to health care.⁷

Out of pocket expenditure was a source of financing for 91% of breast cancer patients in Punjab. The national survey reveals that the households having persons with cancer spend most of it out of pocket. Around 33.5% to 39.2% of them borrowed or sold assets for inpatient treatment and around 3.3% to 4.0% of them borrowed or sold assets for outpatient treatment in the year preceding the survey.⁸

So, the present study is planned to study presence, magnitude and determinants of the expenditure differences with reference to gender among adult cancer patients attending Regional Government Cancer Hospital of Marathwada, Maharashtra India.

STUDY OBJECTIVES:

Primary Objective- To study the presence and magnitude of the expenditure differences with reference to Gender among adult cancer patients attending Regional Government Cancer Hospital of Marathwada, Maharashtra, India.

Secondary Objective -

1. To study the factors associated with expenditure inequality with Reference to gender on adult cancer patients.
2. To calculate the average expenditure of female cancer patients.

METHODOLOGY:

The present study is a hospital based cross sectional study. All cancer patients attending Regional Government Cancer Hospital during the study periods those diagnosed outside will be included in the study. After getting approval from institutional ethical committee the data collection was carried out in two months (1July –31August 2019).

Sample size - In both sexes combined, lung cancer is the most commonly diagnosed cancer. And the prevalence of lung cancer in India is 7.5%.⁹ By using the formula $n = 4 pq/l^2$, with 95% confidence interval, the sample size calculated is 111.

All the participants were interviewed by using predesigned and pretested questionnaire. For those who were critically ill or not able to respond- their partners were interviewed. Questionnaires included details about the socio-demographic profile of the patients as well as information related to expenditure (medical and non-medical)

(A) Medical expenditure includes information on doctor's/surgeon's fee, expenditure on medicines, diagnostic tests, bed charges and other miscellaneous expenses (like attendant charges, physiotherapy charges, personal medical appliances, blood and oxygen, Radiological investigations¹⁰).

(B) Non-Medical expenditure includes, travelling, lodging, of the patient and those accompanying caregivers from the household.

Further, detailed information was obtained on the treatment and expenditures (medical as well as non-medical) before coming to the hospital. Also, detailed information related to assets (farm, plot, animals, vehicles), gold sold, loan (Institutional or Non – Institutional) in past for treatment of cancer before coming to the regional Government cancer hospital was obtained from each patient. Receipts of expenditure if available were used to verify.

The data was collected, compiled and then entered in MS Excel 2007 worksheet. It was analyzed using

Statistical Package for Social Sciences trial version 16. Descriptive statistics were calculated and chi square test, t-Test for equality of means, ANOVA, Tukey Post Hoc test, were applied wherever required. $P < 0.05$ was considered as statistically significant. Vancouver system was used for citing and listing of references.

Observation and Results-

Table 1 - Socio-demographic profile of study participants

Socio-Demographic characteristics		FEMALES	MALES
		Frequency (%)	Frequency (%)
Age (Years)	≤20	2(3.2)	2(4.1)
	21-30	5(7.9)	4(8.2)
	31-40	7(11.1)	4(8.2)
	41-50	15(23.8)	5(10.2)
	51-60	16(25.4)	11(22.4)
	>60	18(28.6)	23(46.9)
	Total	63(100)	49(100)
Education	Illiterate	34(54)	19(38.8)
	Literate	2(3.2)	1(2.0)
	Primary school certificate	6(9.5)	7(14.3)
	Middle School certificate	13(20.6)	13(26.5)
	High school Certificate	5(7.9)	6(12.2)
	Intermediate / post Certificate	3(4.8)	3(6.1)
	Total	63(100.0)	49(100.0)
Occupation	Unemployed	19(30.2)	2(4.1)
	Unskilled worker	40(63.5)	43(87.8)
	Semi skilled worker	2(3.2)	2(4.1)
	Skilled worker	1(1.6)	1(2.0)
Family	Profession	1(1.6)	1(2.0)
	Total	63(100.0)	49(100.0)
	Joint family	57(90.5)	48(98)
	Three Generation family	5(7.9)	1(2.0)
	Nuclear family	1(1.6)	0(0)
	Total	63(100.0)	49(100.0)

Socio economic status	Upper class- (≥ 6254) INR	2(3.2)	3(6.1)
	Upper Middle class(3127-6253)	8(12.7)	5(10.2)
	Middle class(1876-3126)	13(20.6)	6(12.2)
	Lower middle class(938-1875)	25(39.7)	19(38.8)
	Lower class(<938)	15(23.8)	16(32.7)
	Total	63(100.0)	49(100.0)
Religion	Hindu	53(84.1)	46(93.9)
	Muslim	9(14.3)	3(6.1)
	Buddhist	1(1.6)	0(0)
	Total	63(100.0)	49(100.0)
BMI	underweight= $<18.5\text{kg/m}^2$	5(7.9)	6(12.2)
	normal= $18.5- 24.9\text{kg/m}^2$	38(60.3)	32(65.3)
	overweight= $25- 29.9\text{kg/m}^2$	20(31.7)	11(22.4)
	Total	63(100.0)	49(100.0)

Table 1 shows 49 (77.8%) females and 39(79.5%) males belonged to age group more than 40 years ; 34 (54%) females and 19(38.8%) males are illiterate; 40(63.5%) females and 43(87.8%) males are unskilled workers; 19(30.2%) females and only (4.1%) males are unemployed ;57 (90.5%) females and 48 (98%) males belongs to joint family ; 15(23.8%) females and 16 (32.7%) males belonged to lower class ; 5(7.9%) females and 6(12.2%) males belongs to underweight category.

Table 2 –Distribution of study participants according to type of cancer

Type of cancer	Female	Male
Carcinoma of Gastrointestinal system	8(12.7)*	10(20.4)
Carcinoma of Genitor-urinary system	21(33.3)	3(6.1)
Carcinoma of lung	4(6.3)	6(12.2)
Carcinoma of Breast	8(12.7)	0(0.0)
Carcinoma of Oral, throat cavity	7(11.1)	10(20.4)
Carcinoma of Renal Origin	2(3.2)	0(0.0)
Carcinoma of other type (Endocrine, Skin, BCC, SCC, Blood, Neural)	13(20.6)	5(10.2)
Carcinoma of Bone	0(0.0)	3(6.1)
Total	63(100).	49(100)

*Figures in parenthesis are percentages

Table 2 shows in females- the most common cancer was carcinoma of genitor-urinary system (33.3%) followed by carcinoma of breast (12.7%); while in males most common cancer were carcinoma of oral, throat cavity (20.4%) and , carcinoma of gastrointestinal system (20.4%) followed by carcinoma of lung (12.2%).

Table 03. Distribution of differences between total expenditure according to gender (₹)

Gender	Total Expenditure(₹)	Mean ± s.d	T-test	P-Value
Male	55,63,385	113538.47 ± 419818.66	1.496	0.032
Female	21,49,870	34124.91 ± 37226.34		
Total	77,13,255			

Table 03 shows that mean expenditure of male was ₹ 113538.47 ± 419818.66 while in females mean expenditure was ₹ 34124.91 ± 37226.34; this difference in total expenditure and in relation to gender was found statistically significant. (t=1.496; p value <0.05)

Table 4 a- Age group wise distribution of total expenditure (₹)

Age Group (years)	N	95% Confidence Interval for Mean						
		Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
≤20	4	756062.5	1470297.56	735148.78	1583509.01	3095634.01	8200	2961400
21-30	9	46587.78	44817.90	14939.30	12137.69	81037.87	3950	151870
31-40	11	27666.27	18840.45	5680.61	15009.09	40323.46	5390	60730
41-50	20	35701.25	30204.02	6753.82	21565.33	49837.17	5020	118700
51-60	27	60219.65	71577.02	13775.0	31904.72	88534.57	2850	316050
>60	41	39644.63	48226.17	7531.66	24422.58	54866.69	2900	267600
Total	112	68868.34	280277.10	26483.77	16389.13	121347.56	2850	2961400

Table 4 (A) shows age group wise distribution of total expenditure in which it was found that mean expenditure (756062.5) in age group less than 20 years was more as compare to other age groups. (Fig-02) There was statistically significant difference between groups as determined by one-way ANOVA ($F(5,106) = 6.192, p = 0.000$)

figure 01- Distribution of mean expenditure according to age group

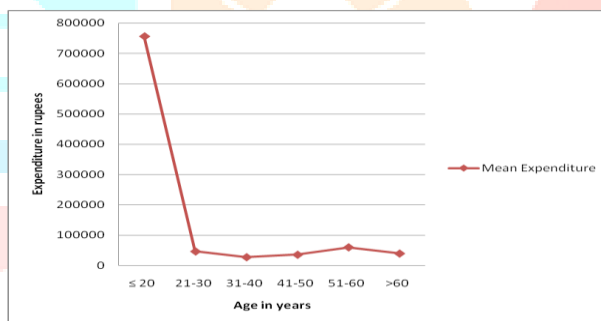


Table 4 b – Total expenditure according to different age groups (₹) (tukey post hoc test)

Age	Total expenditure		
	Df	F	P value
Between Groups	5	6.192	0.000
Within Groups	106		
Total	111		

(Table 4B) Tukey post hoc test revealed that expenditure was significantly higher only in age group <20 years as compared to other age groups, but their association of occupation, socioeconomic status, type of family, religion and total expenditure was not found statistically significant ($p > 0.05$)

Table 05- Distribution of medical and non-medical expenditure (₹)

Total expenditure (₹)		Mean ± S.D	t-test	p value
Non-Medical	63,14,27	7162.91 ± 15602.40	2.161	0.015
Medical	70,81,828	63230.61 ± 2.74		

Table 05 shows that mean non-medical expenditure was ₹ 7,162.91 ± 15602.40. While the mean medical expenditure was ₹ 63230.61 ± 2.74. This difference was found to be statistically significant. (t value 2.161, p<0.05)

Table 06- Distribution of expenditure according to gender (₹)

Expenditure	Gender	Mean± S.D	t-test	p value
Non- medical	Male	11110.92 ± 22075.13	2.412	0.00
	Female	4092.24 ±6054.24		
Medical	Male	105913.67 ± 4.11	1.461	0.034
	Female	30032.67 ± 36029.66		
OPD	Male	191118.37 ± 21133.91	3.103	0.041
	Female	9031 ± 13071.81		
Non medical OPD expenditure	Male	86795.31 ± 4.08	1.273	0.041
	Female	21001.16 ± 36771.58		
IPD Expenditure	Male	6615.82 ± 19418.14	1.791	0.014
	Female	2179 ± 2844.51		
Non-medical IPD expenditure	Male	4495.10 ± 10817.22	1.64	0.007
	Female	1912.71 ± 5534.23		

Table 06 shows that mean non-medical expenditure in males ₹ 11110.92 ± 22075.13 and mean non-medical expenditure in females ₹ 4092.24 ± 6054.24. This difference was found to be statistically significant in relation to gender (t=2.412, p <0.05). mean medical expenditure in males ₹ 105913.67 ± 4.11 and mean medical expenditure in females ₹ 30032.67 ± 36029.66. This difference was found to be statistically significant in relation to gender (t= 1.461, p <0.05). mean OPD expenditure in males ₹ 191118.37 ± 21133.91 and mean OPD expenditure in females ₹ 9031 ± 13071.81. This difference was found to be statistically significant in relation to gender (t=3.103, p<0.05). mean Non-medical OPD expenditure in males ₹ 86795.31 ± 4.08 and in females ₹ 21001.16 ± 36771.58. This difference was found to be statistically significant in relation to gender (t=1.273, p<0.05) mean IPD expenditure in males ₹ 6615.82 ± 19418.14 and in females ₹ 2179 ± 2844.51. This difference was found to be statistically significant in relation to gender (t=1.791, p<0.05). mean Non-medical IPD expenditure in males ₹ 4495.10 ± 10817.22 and in females ₹ 1912.71 ± 5534.23. This difference was found to be statistically significant in relation to gender (t=1.64, p<0.05)

DISCUSSION:

Health is a basic human right. However, health inequities abound, especially, in developing countries, with high levels of poverty. Research shows that there is substantial variation in the population in terms of health status, health investments undertaken, access and utilization of healthcare service. Analogous to other inequities, gender discrimination manifests itself in both lower health investments as well as worse health status of women relative to men.

In present study, in females- the most common cancer was carcinoma of genitor- urinary system (33.3%) followed by carcinoma of breast (12.7%); while in males most common cancer was carcinoma of oral, throat cavity (20.4%) and, carcinoma of gastrointestinal system (20.4%) followed by carcinoma of lung (12.2%). In study conducted by Batra A, Gupta I, Mukhopadhyay A cancers are classified into three kinds those specific to females (*female cancer*: breast cancer and cervical cancer; 97 patients), those specific to males (*male cancer*: penile cancer; 4 patients) and those cancers which occur in both men and women (*common cancer*: head and neck, brain, bone, urinary gastro-intestinal, liver and lungs; 101 patients). Around 53 percent of males suffer from head and neck cancer whereas around 50 percent of females suffer from cervical cancer⁴.

Sheng Han, Yan Chen, Xu Ge, Ming Zhang, Jinwei Wang, Qingbo Zhao, Jianjun He ZW found squamous cell carcinoma (SCC), adenocarcinoma, sarcoma, lymphoma, respectively¹¹

In present study, the association of total expenditure and gender was found to be statistically significant p value (0.032). Rout, Himanshu similarly observed a significant difference between the average male and female household expenditure in rural, urban and combined areas¹².

Batra A, Gupta I, Mukhopadhyay A observed that gender discrimination accounts for 73% of the gender difference in cumulative total expenditure and 64% of the difference is on account of gender discrimination in cumulative medical expenditure⁴. In present study medical expenditure was higher in males than females. As similarly observed in other studies^{11,13}.

In study conducted by Maharana B, Ladusingh L that gender differences exist among the elderly in expenditure on different health items like medicines, X-ray, ECG, pathological tests, doctor/surgeon's fee, hospital and nursing home charges, and other medical expenses. For all health items, expenditure on males is relatively high as compared to females for both time periods¹⁴.

In present study mean non-medical expenditure was ₹ 7,162.91 ± 15602.40. While the mean medical expenditure was ₹ 63230.61 ± 2.74. This difference was found to be statistically significant (t value 2.161, p < 0.05). While in study conducted by Sneha LM, Sai J, Sunitha Ashwini S, Ramaswamy SM, Rajan M, Scott JX found non-medical expenses account for about 46% of their monthly household income of parents from rural areas and 22% of their household income from urban areas. Out-of-pocket expenses for food, travel and accommodation have emerged as a major contributing factor for severe economic effect on the family as it accounts for two-thirds of the total expenses incurred during each hospital admissions. In a comparison made between medical and nonmedical expenses, mean nonmedical constitutes more than 45% of the total expenditure. A significantly higher proportion of rural families had reported higher costs for travel, accommodation, food, long distance telephone calls¹⁵.

Tsimicalis, Argerie & Stevens, Bonnie & J Ungar, Wendy & McKeever, Patricia & Greenberg, Mark & Agha, Mohammad & Guerriere, Denise & Naqvi, Ahmed & Barr, Ronald. have reported that three-quarters of the costs incurred by the families were attributed to travel (56%) and food (18%)¹⁶.

The findings were different from present study in which medical expenditure is high as tertiary cancer centre is not usually first point of contact for ailing individuals. Howard et al. have proved that sustained approach involving training of doctors and nurses in remote areas, transfer of diagnostic and therapeutic protocols, improving supportive care at regional centers, financial aid, can result in impressive reductions in abandonment¹⁷.

In present study association of socio-economic status and final expenditure has not found statistically significant while in study conducted by Batra A, Gupta I, Mukhopadhyay A the results also indicate that educated individuals have higher cumulative total as well as medical expenditures, and the rich as well as the less indebted spend more. Among other results, household size positively and significantly impacts medical expenditures, but not total expenditure also in similar study results show that if a patient is female, the mean cumulative expenditure is less by ₹.23, 698(PPP\$9479). Therefore, 73 percent of the overall difference in cumulative expenditures (₹. 32,446(PPP\$ 12978)) is explained by gender difference in expenditures among patients suffering from common cancers In a similar vein, the gender difference in cumulative medical expenditure is ₹ 14,578(PPP\$5831), which is around 64 percent of the total difference in cumulative medical expenditure⁴.

There is significant “gender” discrimination seen at various levels of treatment (like IPD, OPD, Medical, Non-medical etc) in terms of expenditure. Further studies are required on common cancers to strengthen this genders inequality.

CONCLUSION:

A nation’s health policy should, fundamentally, address the questions of cost, access and quality in health care. Cancer is one such disease, where the financial burden of treatment is a major source of stress for patients and families. The out of –pocket costs incurred because of the illness can consume substantial part of income and family budget. In the present study statistically, significant difference was seen in Expenditure on adult cancer patients with special reference to ‘Gender’ at various levels like medical and non-medical expenditure. Empowerment of women through policies can reduce disparities in women’s and men’s access to resources in the household for health expenditures. Intra-Household discrimination is hard to tackle from outside. For that messages needs to be women centric and services women –friendly.

ACKNOWLEDGEMENT: This Research study is done as Indian Council of Medical Research, STS-2019 Project, New Delhi, India.

CONFLICT OF INTEREST: No

REFERENCES:

- (1) National Institute of Cancer Prevention and Research]. Nicpr.res.in.
2019 Available from: <http://nicpr.res.in/>
- (2) Pakseresht S, Ingle GK, Garg S, Singh MM. Expenditure audit of women with breast cancer in a tertiary care hospital of Delhi. Indian J Cancer. 2011; 48(4):428–37.
- (3) Nair KS, Raj S, Tiwari VK, Piang LK. Cost of treatment for cancer: Experiences of patients in public hospitals in India. Asian Pacific J Cancer Prev. 2013; 14(9):5049–54.
- (4) Batra A, Gupta I, Mukhopadhyay A. Does discrimination drive gender differences in health expenditure on adults: Evidence from Cancer patients in rural India. Discuss Pap Econ. 2014;14(03).

- (5) Amutha D. In Reply: BEHAVIOUR THERAPY. Br Psychiatry [Internet]. 1965;111(479):1009–10. Available from
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2906950
- (6) India ranks 108th in WEF Gender gap index 2018, Iceland tops the list .
dna.2019 Available from: <https://www.dnaindia.com/business/report-india-ranks-108th-in-wef-gender-gap-index-2018-iceland-tops-the-list-2697757>
- (7) Hiremath R. Gender: Is It A Barrier For Access To Healthcare In India?
Int J Sci Eng Res. 2013;36.
- (8) Chakrabarty J, Pai MS, Ranjith VK, Fernandes D. Economic burden of cancer in India. Indian J Public Heal Res Dev. 2017;8(3):137–41.
- (9) Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin [Internet]. 2018;68(6):394–424. Available from: <https://g8fip1kplyr33r3krz5b97d1-wpengine.netdna-ssl.com/wp->
- (10) Rajpal S, Kumar A, Joe W. Economic burden of cancer in India: Evidence from cross-sectional nationally representative household survey, 2014. PLoS One. 2018; 13(2):1–17.
- (11) Sheng Han, Yan Chen, Xu Ge, Ming Zhang, Jinwei Wang, Qingbo Zhao, Jianjun He ZW. Epidemiology and cost analysis for patients with oral cancer in a university hospital in China. BMC Public Heal 2010; 10 196 Publ online 2010 Apr 16 doi 101186/1471- 2458-10-196 [Internet]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2864212/>
- (12) Rout, Himanshu. (2010). Gender and Household Health Expenditure in Odisha, India. Journal of Health Management. 12. 445-460. 10.1177/097206341001200403
- (13) Basavaiah G, Rent PD, Rent EG, Sullivan R, Towne M, Bak M, et al. Financial Impact of Complex Cancer Surgery in India: A Study of

Pancreatic Cancer. *J Glob Oncol.* 2018;(4):1–9

(14) Maharana B, Ladusingh L. Gender Disparity in Health and Food Expenditure in India among Elderly. *Int J Popul Res.* 2014;2014:1–8

(15) Sneha LM, Sai J, Sunitha Ashwini S, Ramaswamy SM, Rajan M, Scott JX. Financial burden faced by families due to out-of-pocket expenses during the treatment of their cancer children: An Indian perspective. *Indian J Med Paediatr Oncol.* 2017;38(1):4

(16) Tsimicalis, Argerie & Stevens, Bonnie & J Ungar, Wendy & McKeever, Patricia & Greenberg, Mark & Agha, Mohammad & Guerriere, Denise & Naqvi, Ahmed & Barr, Ronald. (2013). A Mixed Method Approach to Describe the Out-of-Pocket Expenses Incurred by Families of Children With Cancer. *Pediatric blood & cancer.* 60. 10.1002/pbc.24324

(17) Howard, Scott & Pedrosa, Marcia & Lins, Mecneide & Pedrosa, Arli & Pui, Ching-Hon & Ribeiro, Raul & Pedrosa, Francisco. (2004). Howard SC, Pedrosa M, Lins M, Pedrosa A, Pui CH, Ribeiro RC, Pedrosa Establishment of a pediatric oncology program and outcomes of childhood acute lymphoblastic leukemia in a resource-poor area. *JAMA* 291: 2471-2475. *JAMA : the journal of the American Medical Association.* 291. 2471-5. 10.1001/jama.291.20.2471.