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Assessment of Treatment Cost, Patient Satisfaction and Quality of Life in the Cancer Patients Using Indian Traditional Medicine

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Abstract

The aim of the study was to compute the treatment cost, patient satisfaction and quality of life among the cancer patients treated with complementary and alternative medicine. A cross sectional study was conducted between 2017 and 2019. The individual patient's treatment cost, patient satisfaction and quality of life was assessed. In our study totally 379 patients were selected for the study. All required data was collected and recorded from patient's case sheet, investigation reports, interviewing patients and/ or patient care givers. Average total cost spent by the study population for the direct medical and direct non-medical costs were Rs 7790 (USD107). The direct medical cost for males and females were found be Rs. 1550 (21.23 USD) and Rs. 1475 (20.20 USD) respectively, for the direct medical expenses. Rs. 1962 (26.88 USD), Rs. 1968 (26.96 USD), Rs. 1850 (25.34 USD), Rs. 1898 (26.00 USD) and Rs. 1908 (26.14 USD) spent to treat brain, stomach, lungs, kidneys and liver cancers respectively. 89.18% and 10.82% of patients expressed that they were generally satisfied and not satisfied respectively. The mean score for physical, psychological, social, environmental and overall domains was 10.76, 10.33, 11.16, 13.75 and 9.99 for males.

The overall domains school level education respectively while for the college level educated populations were observed as 10.50, 10.04, 10.21, 11.30 and 9.24. The study findings conclude that the direct medical costs were high and the patients and care takers were satisfied with the CAM treatment. We recommend that continuous education and creating awareness on the CAM therapies could significantly enhances the patients the QoL.

Keywords: *Cancer, Patient satisfaction, Quality of Life, Treatment cost, Traditional Medicine.*

Introduction

Cancer is a highly prevalent chronic condition and leading cause of morbidity and mortality worldwide. The mortality rate has been declined is due to early diagnosis, enhanced surgical and radiotherapy procedures to enhance systemic therapies. The detection and treatment of cancer has negative impact on individual functional, mental and emotional well-being and overall quality of life

stated. Hadeel (2018) Cancer patients may be affected by physiological, psychological, and socioeconomic challenges in the society. The more stress, anxiety, depression, are common during cancer diagnosis and treatment, which can directly affect the individual patient's health related quality of life. The chemotherapy either in allopathy or traditional treatment should demonstrate reduction of cancer symptoms and/ or related conditions is more important in the cancer treatment. Aelee (2017) In Western countries, 40–90% of cancer patients use CAM. (Hadeel 2018; Aelee 2017 and Jutta 2017) In most of the countries, the payment has to be taken by the patients itself for CAM treatment. Jutta Huebner et al has reported that CAM seems to be more attractive to cancer patients to control the further occurrence of cancer associated burden in the community. Jutta (2017) A study reported that 79% of cancer patients were having awareness of the benefits and risks of CAM treatments. Friederike (2020)

In cancer patients the prevalence of CAM usage of CAM will differs with different cultures and regions. Overall CAM use in European studies has been relatively less than CAM used in Asian studies. The utilization of herbal medicine is high in Asian cancer patients, whereas western cancer patients primarily have used non herbal medicine for the cancer treatment. The high use of herbal medicine among Asians typically based on a belief that traditional Chinese medicine helps to enhance cancer prognosis. Aelee (2017) CAM is defined by the National Centre for Complementary and Alternative Medicine as ''a group of diverse medical and health care systems, practices, and products, presently these are not considered to be a part of conventional medicine". Tabish (2008) The more demand for complementary therapies by cancer patients during their disease is increasing now a days to reduce the adverse effects of cancer therapy and also to enhance their Quality of Life (QoL). The QoL defined as the sense of well-being and it involves; the physical, mental, social and spiritual characteristics of an individual. Hadeel (2018) CAM comprises a various set of healing philosophies, therapies, and products. Previous research studies have been conducted to assess the expenditures for CAM therapies conducted.

The previous research studies revealed that the total out-of-pocket expenses for CAM use in adults was estimated at $27.0 billion per year, with $12.2 billion of the total going payment towards the CAM professionals like acupuncturists, chiropractors, and massage therapists. This report has predicted that CAM survey supplement administered as a part of the sample adult questionnaire of the 2007 National Health Interview Survey (NHIS). The total cost and price per visit for all CAM therapies are used; the prevalence of use of individual CAM therapies and also the associated per-visit costs to a CAM are represented in various research studies. NHIS data indicated that the U.S. public makes over 300 million visits to CAM providers annually invest billions of dollars for the treatment and also for self-care practices of CAM. Nahin (2009) In this present study an attempt was taken to compute the treatment cost, patient satisfaction and quality of life among the cancer patients treated with CAM.

Method

Study Setting

A cross sectional study was conducted between 2017 and 2019. The individual patient's treatment cost, patient satisfaction and quality of life was assessed. The data collection was started after obtaining prior permission from the Independent Human Ethics Committee, Ahmedabad, India

(IRB00005741; dated 20th July 2019). The study was carried out in the selected clinics treating cancer patients by Indian traditional medicine system in the ambulatory setup located in the Khozikode District, Kerala. The clinical data was collected in a self-designed data collection form.

Inclusion criteria

- Patients with more than 18 years of age.
- Patients should reside not more than 50KM from the clinic
- Patients with brain, stomach, lungs, kidney(s) and liver.
- Patients who are willing to enroll in the study.

Exclusion criteria

- All vulnerable patients.
- Patients with lack of interest to participate in the study.

Consent was obtained from all eligible patient's prior to start of the study.

Study procedure

The patient's satisfaction was collected from patients visits for consultation within 5 systems of ITM (ayurveda, homeopathy, siddha, unani and naturopathy medicines) in the selected study centre. The cross-sectional study design was carried out among the adult cancer patients who can able to speak, write and read Malayalam language during the study period.

Study Questionnaire

Entire questionnaires were got from all the eligible patients. The PQS-III (using the EORTC QLQ-C30 instrument) was provided to the patients during the consultation visit with the physician. Fayers (2002) PSQ-III consists of 50 questions categorized into 7 domains. 1st domain consists of 6 questions regarding general question, 2nd domain consists of 10 questions related to technical, 3rd domain consists of 7 questions related to interpersonal, 4th domain consists of 5 questions related to communication, 5th domain consists of 8 questions related to financial aspects, 6th domain consists of 2 questions related to time spent with doctor and 7th domain consists of 12 questions related to accessibility and convenience. The measurement PSQ-III scale has positive and negative scores. The assessment was assessed by using 5 – Likert point scale [Strongly disagree, disagree, neutral, agree, strongly agree]. The questionnaire was adopted and got permission from Imran et al. Imran (2019) Patients were interviewed by using a semi-structured questionnaire. In our study, Ayurveda, Homeopathy, Siddha, Unani and Naturopathy medicines are used as ITMS. The cost analysis included in physician consultation, medication and travel expenses. The measurement of outcome is used in the economic analysis data on quality of life (WHO BREF scale). Sreedevi (2016)

Study data collection

Total cost is the sum of direct medical and direct non-medical costs. The direct medical cost comprises of drug costs, laboratory charges and physician consultation charges whereas the direct

non-medical costs comprise of amount spent for transportation while visiting to hospital, food and loss of wage(s). All essential data was collected and recorded from patient's case sheet, investigation reports, interviewing patients and/ or patient care givers. Few data were collected either from prescriber or pharmacy. The drug cost was collected directly from the either physician or pharmacy.

Statistical analysis

The statistical analysis was done using online statistical calculator (Social Statistics). In our study p-values were computed from chi-square, Z and t for demographic data, patient satisfaction and quality of life respectively.

Results

In our study totally 379 patients were selected for the study. The demographic details were already published by the same authors Manju K Mathew et al. Manju (2021) Average total cost spent by the study population for the direct medical and direct non-medical costs were Rs 7790 (USD107). Rs. 1500 (USD 21) (19.26%) was spent against the investigations or laboratory costs whereas Rs. 2505 (USD 34) (32.16%) and Rs. 1785 (USD 24) (22.91%) was spent to purchase anti-cancer and other than anti-cancer drugs respectively. Out of 379 patients, 25.67% of was spent Rs. 2000 (USD 27) as physician's consultation charges during the study period. The data are given in Table 1.

Table 1

Computation of direct and non-direct medical costs among the study population

Item	Costs		Total cost (%)
	INR	USD	
Diagnosis/ Lab cost	1500±250	21±3.43	19.26
Anti-cancer Medication cost	2505±300	34±4.11	32.16
Other medication cost	1785±290	24±3.97	22.91
Doctor consultation charge	2000±500	27±6.85	25.67
Total	7790±1340	107±18.36	

The collected data was represented in mean ± SD.

The direct medical cost for males and females were found be Rs. 1550 (21.23 USD) and Rs. 1475 (20.20 USD) respectively for the direct medical expenses while for the Rs. 750 (10.27 USD) and Rs. 800 (10.96 USD) for the males and females respectively. We found that there is no significant difference between both the genders (P = 0.4989). 21 to 30, 31 to 40, 41 to 50, 51 to 60 and < 61 years of age group spent Rs. 1904 (26.08 USD), Rs. 1760 (24.11 USD), Rs. 1936 (26.52 USD), Rs. 1740 (23.84 USD) and Rs. 1634 (22.51 USD) spent for direct medical expenditure respectively. While Rs. 911 (12.48), 968 (13.26 USD), Rs. 881 (12.07 USD), Rs. 984 (13,48) and Rs. 750 (10.27 USD) spent for direct non-medical expenditure respectively. The study results showed that there is a significant difference between among the age groups was observed (P < 0.0001). The data given in table 2.

Rs. 1962 (26.88 USD), Rs. 1968 (26.96 USD), Rs. 1850 (25.34 USD), Rs. 1898 (26.00 USD) and Rs. 1908 (26.14 USD) spent to treat brain, stomach, lungs, kidneys and liver cancers respectively as

direct medical costs while direct non-medical costs were Rs. 764 (10.47 USD), Rs. 780 (10.68 USD), Rs. 944 (12.93 USD), Rs. 790 (10.82 USD) and Rs. 824 (11.29 USD) spent to treat brain, stomach, lungs, kidneys and liver cancers respectively. From the study results we identified that there is a significant difference between among the type of cancers groups were observed ($P < 0.0001$). The data given in table 2.

Table 2

Cost per patient for gender and age wise distribution and type of cancer among the study population

Parameters	**Direct Medical Cost**		**Direct Non-Medical Cost**	
	INR	**USD**	**INR**	**USD**
Gender				
Male	1550±189	21.23±2.33	750±126	10.27±2.59
Female	1475±151	20.20±2.53	800±155	10.96±2.07
P - Value				0.4989
Age				
21 to 30	1904±153	26.08±2.72	911±107	12.48±2.10
31 to 40	1760±135	24.11±2.39	968±140	13.26±1.85
41 to 50	1936±178	26.52±2.91	881±114	12.07±2.44
51 to 60	1740±126	23.84±2.88	984±144	13.48±1.73
< 61	1643±192	22.51±2.70	750±127	10.27±2.63
P - Value				< 0.0001
Types of cancer				
Brain	1962±150	26.88±2.21	764±106	10.47±2.05
Stomach	1968±133	26.96±2.10	780±194	10.68±1.82
Lungs	1850±109	25.34±2.37	944±190	12.93±2.60
Kidneys	1898±108	26.00±2.60	790±128	10.82±1.48
Liver	1908±170	26.14±2.44	824±176	11.29±2.33
P - Value				< 0.0001

The data are represented in mean±SD. One-Way ANOVA Calculator, including Tukey HSD tested at 0.05 significance level.

From our study results 89.18% and 10.82% of patients expressed that they were generally satisfied and not satisfied respectively whereas 92.61% and 7.29% has informed that the consultant has good technical quality and bad respectively while 83.91% and 16.09% has informed that the consultant has interpersonal ability and improper interpersonal ability respectively. There is a significant difference between among the type of cancers groups were observed ($P < 0.0001$). The patient's satisfaction results revealed that the 97.10% and 2.90% of consultants was good and bad communication skill while 93.14% and 6.68% of patients said that they were satisfied the time spent with doctor and not satisfied respectively while 84.70% and 15.30% of patients informed that easy and difficult in accessibility as well as convenience respectively. The financial aspects were also measured among the study patients and found to be 80.21% and 19.79% of patients were affordable and not affordable respectively. The study results showed there is a significant difference between among the type of cancers groups were observed ($P < 0.0001$). The collected data was depicted in table 3.

Table 3

Patient Satisfaction among the study populations

Items		N (%)	P - Value
General satisfaction	Yes	338 (89.18)	
	No	41 (10.82)	
Technical quality	Good	351 (92.61)	
	Bad	28 (7.39)	
Interpersonal manner	Yes	318 (83.91)	
	No	61 (16.09)	
Communication	Satisfactory	368 (97.10)	
	Not satisfactory	11 (2.90)	
Time spent with doctor	Enough	353 (93.14)	
	Not enough	26 (6.86)	
Accessibility and convenience	Easy	321 (84.70)	
	Difficult	58 (15.30)	
Financial aspects	Affordable	304 (80.21)	
	Not affordable	75 (19.79)	
Overall	Satisfied	336 (88.65)	
	Not Satisfied	43 (11.35)	< 0.0001

The proportions were compared using independent samples t-test and one-way ANOVA using Tukey's HSD tested at 0.05 significance level.

The mean score of quality of life was 11.93, 12.76, 13.01, 14.99 and 10.59 were observed for physical, psychological, social, environmental and overall domains respectively. There is a significant difference between among various domains were observed (P < 0.0035). The data was represented in table 4.

Table 4

Mean quality of life scores measured using WHO- BREF scale in different domains among study population using ITM

Domains	Mean ±SD	P – Value
Physical	11.93±1.28	
Psychological	12.76±1.93	
Social	13.01±1.56	
Environmental	14.99±1.71	
Overall	10.59±1.66	<0.0035

P value was kept at 0.05 statistically significance level.

The mean score for physical, psychological, social, environmental and overall domains was 10.76, 10.33, 11.16, 13.75 and 9.99 for males whereas for females it was 9.28, 11.65, 12.45, 14.02 and 8.12 respectively. There is a significant difference between among various domains were observed (P < 0.05) in both the genders. While 11.70, 10.21, 10.07, 9.27 and 9.82 mean score for physical,

psychological, social, environmental and overall domains were observed among the age group between 21 and 40 whereas 9.19, 11.61, 11.69, 10.66 and 9.25 for the age group between 41 and 60 respectively. The study results revealed that there is a significant difference between among various domains was observed ($P < 0.05$) in both the age groups. 10.84, 11.02, 11.30, 11.31 and 9.25 were measured as a mean score for physical, psychological, social, environmental and overall domains among married group of study population while 11.27, 10.94, 10.21, 10.75 and 9.40 for the unmarried group of study population. The study results revealed that there is a significant difference between among various domains was observed ($P < 0.05$) in both the groups. The data results were represented in the table 4.

Mean score for the physical, psychological, social, environmental values include 9.67, 9.53, 9.24. 10.79 and 9.35. The overall domains school level education respectively while for the college level educated populations were observed as 10.50, 10.04, 10.21, 11.30 and 9.24. But there is a significant difference between among various domains was observed ($P < 0.05$) in both the groups. The mean score for physical, psychological, social, environmental and overall domains was 11.80, 11.95, 9.92, 9.06 and 9.18 respectively, for the population has the cancer for about 1 to 3 months and for 4 to 6 months 9.43, 9.01, 9.86, 9.78 and 9.00 for physical, psychological, social, environmental and overall domains respectively. The study results showed that there is a significant difference between among various domains was observed ($P < 0.05$) in both the groups. The data are given in the table 5.

Table 5

Association of socio-demographic variables with WHOQOL-BREF domains for the study population using CAM

Factors	Physical	Psychological	Social	Environmental	Overall
Gender					
Male	10.67±1.11	10.33±1.17	11.16±1.90	13.57±1.48	9.99±1.88
Female	9.28±0.97	11.65±1.74	12.45±2.01	14.02±1.76	8.12±1.09
P – Value					< 0.05
Age (Years)					
21 to 40	11.70±1.37	10.21±1.64	10.07±1.32	9.27±1.75	9.82±1.24
41 to 60	9.19±2.86	11.61±2.37	11.69±3.00	10.66±1.42	9.25±1.21
P – Value					< 0.05
Marital status					
Married	10.84±1.01	11.02±1.37	11.30±1.34	11.31±1.54	9.25±1.55
Unmarried	11.27±1.64	10.94±1.31	10.21±1.18	10.75±1.44	9.40±1.06
P – Value					< 0.05
Education Level					
School	9.67±1.82	9.53±1.81	9.24±1.67	10.79±1.05	9.35±1.74
College	10.50±1.14	10.04±1.03	10.21±1.12	11.30±1.64	9.24±1.80
P – Value					< 0.05
Duration					
1 to 3 months	11.80±1.20	11.95±1.48	9.92±1.05	9.06±1.41	9.18±1.53
4 to 6 months	9.43±1.82	9.01±1.71	9.86±1.96	9.78±1.13	9.00±1.92

P – Value	< 0.05

The proportions were compared using independent samples t-test and one-way ANOVA using Tukey's HSD.

Discussion

The use of Indian traditional medicine commonly more popular either in the form of herbal or complementary procedures to treatment chronic diseases such as cancer, hypertension, diabetes mellitus, etc. (Viscuse 2017; Deng 2009; Chung 2015; Broom 2009) Earlier findings demonstrated that the use of integrative medicines has shown feasibility, safety and efficacy of the cancer treatment. In the present study, more than 30% of the total costs were spent to purchase the anti-cancer medicines while around 22% were spent for other medications and consultation charges by the study population. Both the costs, direct medical and direct non-medical, were high among the male patients when compared with the females, participants informed that the family were dependent on the male patients. The gender plays an important role in expenditure pattern in Indian scenario when compared with developed countries.

Among all the age groups, 21 to 30 and 41 to 50 age group of patients were spent higher amounts when compared with other age groups including geriatric patients. The reason was found to be these age group of patients have higher productivity than the other age groups. Though there is no much difference among direct medical and direct non-medical costs with respect to the type of cancers. There is statistically significant ($P < 0.0001$) difference observed between both the costs, direct medical and direct non-medical costs. A study conducted by Yin et al has reported that the regression analysis between duration of hospital stay, type of cancer, age, expenditure and hospital facilities were significantly correlated with the cost of the treatment per admission. Yin (2019)

The patient satisfaction and quality of life are the two most important outcomes of the treatment in health care settings. In this present study, majority (around 89%) of the patients were satisfied with in terms of consultant has good technical quality (92. 61%). The findings of the present study were similar to the reports of Mahapatra et al and Kleeberg et al has reported that high levels of patient's satisfaction in the treatment outcomes. (Mahapatra 2016; Kleeberg 2005) However, previous finding was revealed there is an improvement in some aspects such as in decision making, doctor-patient communication and organization of care stated by Broom et al. Broom (2009) Among the study participants most (97.10%) of them reported that consultant has good communication skill while 93.14% of patients said that they were satisfied the time spent with doctor while 84.70% of patients informed that easy accessibility as well as convenience respectively. Similar study was conducted by Mahapatra et al, who found that cancer patient satisfaction was obtained for the communication of doctors. A study by Mahapatra et al stated that overall, the patients and care takers were informed that the irrespective of the type of caners and CAM therapies the patients were satisfied. Mahapatra (2016)

The quality of life of the patients were measured using the WHO BREF questionnaires and found to be high psychological and environmental domain when compared with other domains. The patient QoL is significantly differing among the sub-domains of the WHO BREF questionnaires. The overall QoL scores was significantly varying with gender, whereas male patients mean score was found to be 9.99 ± 1.88 whereas for female it was found to be 8.12 ± 1.09 which is statistically significant ($P <$

0.0035). In the present study, younger adults found to have good score for overall QoL (9.82±1.24) when compared with older adults (9.25±1.21).

CAM therapies were highly specified to treat cancers. In India still few populations, study populations also informed that also, rely on other therapies like mind-body modalities, acupuncture and massage having less impact in the management of the fatigue and pain, anxiety and fears was faced by cancer survivors. Viscuse (2017) Previous CAM studies also demonstrated that the combination of herbal medicine and chemotherapy significantly reduces leukopenia, nausea and vomiting, thrombocytopenia and anaemia, gastric cancer patients etc. The CAM studies have effective role in reducing the symptoms of nausea and vomiting in liver cancer patients. Chung (2015)

Conclusion

From above results it is to conclude that the direct medical costs were high. Among the direct medical cost component, the physician consultation charge is higher than the other cots. Few patients were informed that they had free of cost of treatment for a couple of visits, which includes both direct and direct non-medical costs. In the present study, patients and care takers were satisfied and belief with the CAM treatment. They also informed that numerous quakes are existing in the community and difficult to identify a qualified physician. The study results showed that the quality of life has showed that there is a direct association with gender, age, marital status education level and duration of cancer. The patients revealed that their QoL of patients was found to be minimal level of satisfactory. The main reason for less QoL score is due to their perceived assumption that there is no treatment for the cancer disease. We recommend that continuous education and creating awareness on the CAM therapies could significantly enhances the patients the QoL.

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