



Assessment of Quality of Life of Cervical Cancer Patients Using ECOG-Performance Status Scale

Shubham Lingappanoor¹, Geetha Rani Manupati¹, Vasthalya Meesala¹,
Padma Yaragani^{2*}, Brahmani Bachu¹ and Shyam Sunder Anchuri¹

¹Department of Pharmacy Practice, Balaji Institute of Pharmaceutical Sciences, Laknepally, Narsampet, 506331, Warangal, Telangana State, India.

²Department of Obstetrics and Gynecology, CKMGMH, Kakatiya Medical College, 506002, Warangal, Telangana State, India.

Authors' contributions

This research work was carried out by combined efforts and coordination of all authors. Authors SL, GRM, VM and PY conceptualized and designed the study. Authors SL, VM and GRM performed the data collection. Authors SL, VM and BB conducted the data analysis, interpretation, and prepared manuscript. Authors PY and SSA critically revised the manuscript. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JCTI/2019/v9i330108

Editor(s):

(1) Dr. William C. S. Cho, Queen Elizabeth Hospital, Hong Kong.

Reviewers:

(1) Syed Umer Jan, University of Balochistan, Pakistan.

(2) Michael Bordonaro, Medical Education, USA.

(3) Nishith M. Paul Ekka, Rajendra Institute of Medical Sciences, India.

Complete Peer review History: <http://www.sdiarticle3.com/review-history/50625>

Original Research Article

Received 11 May 2019
Accepted 13 August 2019
Published 19 August 2019

ABSTRACT

Background: Cervical cancer is becoming one of the emerging health burdens for womenhood and India accounts for one-third of the cervical cancer deaths globally. More than 80% of women with cervical cancer are diagnosed at an advanced stage. In this study, we aimed to assess the Quality of Life (QOL) of patients with cervical cancer after treatment and to examine the factors affecting their QOL.

Materials and Methods: This is a retrospective observational study, included 218 cervical cancer patients. The study was conducted in a tertiary care hospital in Warangal of Telangana State. The impact of socioeconomic factors and clinical factors on the QOL of the patients were studied using Eastern Cooperative Oncology Group-Performance status (ECOG-PS) scale. The protocol was approved by KIEC-KMC, Warangal. The statistical analysis was performed by using Fischer's Exact test, a value of $p < .05$ was considered as significant.

*Corresponding author: Email: padma.konda99@gmail.com;

Results: Out of 218 patients 189 were alive and 29 were deceased. Patient of age group 21-40 years, patients from urban areas, from upper socioeconomic status (SES), patients with literacy, without any social habits had good QOL, where as patients in labour forces had poor QOL and are statistically significant. Patients with early stage at diagnosis and patients underwent surgical treatment along with chemoradiation therapy had good QOL yet, these results are statistically insignificant.

Conclusion: The lack of access to preventive and definitive care by the health care sectors, poor socioeconomic status, educational status of the women and awareness regarding the disease and its treatment patterns resulted in poor follow up, low adherence to the treatment, which accentuated the cervical cancer burden. Hence, enhancing the above listed factors could be beneficial in improving QOL of cervical cancer patients.

Keywords: Cervical cancer; chemoradiation; socioeconomic status; quality of life.

1. INTRODUCTION

Cervical cancer is becoming one of the emerging health burdens for womenhood and is estimated that, annually 5,28,000 new cases and 2,66,000 deaths of women worldwide are due to cervical cancer. A disproportionate number of these cases (85%) and deaths (87%) occur among women living in low and middle income countries [1]. India accounts for one-third of the cervical cancer deaths globally. In absolute terms, there are over 130,000 new cases of cervical cancer every year and nearly 74,000 deaths, according to this “per every 7 minutes, Indian women are dying due to cervical cancer” [2]. More than 80% are diagnosed at an advanced stage [3]. India has the largest burden of cervical cancer patients as one in every 5th woman in the world suffering from cervical cancer belongs to India [4]. In India, huge section of the population is from below poverty line who are neither aware nor have accesses to cervical cancer screening, diagnosis, and treatment facilities. Furthermore, despite cervical cancer being the leading cause of cancer mortality in India, accounting for 17% of all cancer deaths among women aged 30–69 years [5].

The health care-related factors such as availability of screening, diagnostic and treatment facilities, quality of treatment and follow-up care are also extremely important in determining survival. In addition behavioral factors such as awareness of cancer symptoms and compliance with screening and treatment are affecting survival [6]. Improvements in early detection and advances in treatments such as chemotherapy, radiotherapy surgery and hormone therapy have played significant roles in the decrease in cancer mortality rates [7-9].

Age-specific data from Globocan 2012 showed peak incidence of cervical cancer in 55-59 year old women with an increasing trend from 40 to 59 years and then a decline after 60 years. However mortality was increasing with increasing age. The age-specific incidence and mortality estimates of India are much higher than the overall estimates in less developed region [10]. The main factor for prognosis and survival for cervical cancer is its staging at presentation. Other factors responsible for survival are age at diagnosis, histological tumor type [11-13]. Additionally, the patients are further deprived due to high medical costs, especially since most of the cases in developing countries are diagnosed at later stages, when the treatment is costly combined with poor prognosis [14]. Many studies have in fact failed to establish a significant relationship between SES and cervical cancer survival mainly because most of such studies were done in a group of patients with similar socioeconomic characteristics and/or had similar accessibility or inaccessibility to cancer treatment facilities [15,16,13,17]. Apart from delayed diagnosis, more women with a lower social position also tend to have comorbid conditions and risky health behaviour, such as smoking which may influence incidence, comorbidity, treatment choice and survival after cervical cancer [18-20]. Survival is determined by age and the extent of disease, with younger women having longer survival, the possibility of a survival rate around 100% is high for ladies with minuscule types of cervical disease [21,22]. Measuring the QOL is based on the patient's own rating of simple questions and can provide an overview of how and to what extent a disease and its treatment affect the lives of patients [23]. Lack of awareness, well organized screening programs & efficient preventive measures are the key factors playing role in the increased incidence and disease progression to the

advanced stages. There is a need to study the factors affecting the QOL of women with cervical cancer. In this study the various factors were taken into consideration, which affect the performance status of the women, including socioeconomic and clinical conditions.

2. MATERIALS AND METHODS

This is a retrospective observational study, conducted in a tertiary care hospital at Warangal of Telangana state, India. The study was carried out over a period of 6 months, from March 2018 to August 2018. The study protocol was approved by Kakatiya Institutional Ethics Committee-Kakatiya Medical College, Warangal. Cervical cancer patients, who had finished at least three months, after the treatment for cervical cancer, married women, with the age >20 years were included in the study. Patients of age <20 years of age, unmarried, with history of hysterectomy and patient with missing data were excluded from the study. The data was collected using the medical records of the patients registered from May-2017 to April 2018. The details which were not included in the records were extracted by the conversation with the patient or her family members, directly or by telephonic contact.

The QOL was assessed by using the ECOG-PS scale, which categorizes cancer patients into five groups: 0, normal activity; 1, strenuous activity restricted; 2, up and about >50% of waking hours; 3, confined to bed/ chair >50% of waking hours; 4, 100% bedridden; and 5, dead [24,25]. The validity and reliability of this instrument have led to its widespread use, for many studies as a prognostic factor or as an inclusion criterion for entry into predictive and prognosis evaluations [26,27].

The study focused on the factors such as the age of patient, occupation, residence, literacy, SES (based on Modified kuppaswamy scale, 2018 [28]), social habits, stage of cancer at the time of diagnosis & the type of treatment received by the patient etc. and their association with the QOL was analyzed by using the Fischer's exact test [29], a value of $p < .05$ was considered as significant.

3. RESULTS

Among the 218 women received treatment for cervical cancer, 189 (86.7%) were alive and 29 (13.3%) were deceased, the mean age of death

in cervical cancer patients found to be 60.1 ± 12.92 Years. The death rate was higher in stage-III and stage-IV of cervical cancer, accounting 8/30 (26.7%) and 2/7 (28.57%) compared to the stage-I and II of cervical cancer 6/75 (8%) and 13/106 (12.26%) respectively [Table 1].

Table 1. Stage wise mortality in cervical cancer patients

Stage of cancer	Alive (n=189)		Dead (n=29)	
	n	%	n	%
Stage I	69	92	6	8
Stage II	93	87.74	13	12.26
Stage III	22	73.33	8	26.67
Stage IV	5	71.43	2	28.57

Table 2. Type of cervical cancer and mortality in cervical cancer patients

Type of SCC cancer	AC	ASC	P-value
n (%)	n (%)	n (%)	(χ^2 , df)
Alive	178 (87.25)	10 (83.33)	1 (50) 0.285
Dead	26 (12.75)	2 (16.66)	1 (50) (2.51,2)

Highest proportion were squamous cell carcinomas (SCC) with 204 cases (93.58%) followed by 12 (5.5%) adenocarcinomas (AC) and 2 (0.92%) adenosquamous cell carcinomas (ASC). The death rate was higher in the patients with AC followed by SCC yet, this found to be statistically insignificant ($p=0.285$) [Table 2].

Table 3. Age at menopause in women with cervical cancer

Age at menopause	No. of cases (n=218)	Percentage (%)
≤ 40 years	48	22.02
≥ 41 years	170	77.98

Among 218 cervical cancer patients, 48 (22.02%) members had early menopause at an age ≤40 years (premature menopause) due to surgical or radiation therapy, 170 members had menopause at the age ≥41years suggestive cervical cancer at post menopausal stage [Table 3].

Through our study, it has been proved that there is a proportional relation between the ECOG-PS scores and inverse relation between the age of the patients and their QOL. The patients of age group 21-40 years had good QOL with ECOG-PS score of 0 and 1-2, patients of age group 41-

60 years had poor QOL, where in the patients of age group 61-80 years the QOL was further reduced, hence in our study, the age of the patients shown the significant differences ($p < .0001$) on their QOL [Table 4].

The patients in labour forces had reduced QOL, where the maximum number of women in labour forces occupied the 1-2, 3-4 of ECOG-PS grades, compared with patients as farmers and housewives. The patients in farming had good QOL compared with patients in labour forces and those who are staying at home. Our study, has a strong association ($p = .013$) between the occupation of the patients and their QOL [Table.4]. Patients from the rural areas had poor QOL when compared with women of urban areas, where, high proportion of patients from rural background were having ECOG-PS scores of 1-2 and 3-4. There was a significant association ($p = .005$) between the residence of the patients and their QOL [Table 4].

Patients with an educational status of middle school and above had a good QOL by occupying the major proportion in ECOG-PS score of 0, illiterates had poor QOL, where the higher proportion of ECOG-PS score of 3-4 were illiterates. Through this, our study had shown as strong association ($p < .0001$) between Level of education of patients and their QOL. In our study the SES of the patients had shown a greater impact on their QOL, where the patients from upper SES had better QOL when compared with the Women with middle and low SES where the higher proportion of the ECOG-PS score of 3-4 were the patients from the middle and low SES and there was a significant association ($p < .0001$) between SES of patients and their QOL [Table 4].

The patients with early stage of cervical cancer had good QOL compared with later stages and the relation between the stage of the cancer and the QOL of the patients was statistically insignificant ($p = .194$) [Table 4].

Out of 189 patients 38 members had the social habits like chewing tobacco, paan, smoking, having snuff and alcohol had poor QOL where the 19 out of 38 (50%) of patients with social habits were in ECOG-PS score of 3-4 and it is statistically significant ($p = .026$). 114 out of 189 patients, received adjuvant radiation therapy (RT) + chemotherapy (CT), which includes surgical treatment along with RT and CT where as 75 members received non-surgical therapy

like RT+CT and RT/CT. Patients received adjuvant RT+CT had good QOL than patients received non-surgical treatments yet, this found to be statistically insignificant ($p = .43$) [Table 4].

4. DISCUSSION

In the present study, out of 218 members of cervical cancer patients, 189 (86.7%) were alive and 29 (13.3%) were deceased. The death rate in current study was less than the annual death rate 27%, reported by the researchers Marc A. Koopmanschap et al. [30]. The mean age of death in cervical cancer patients found to be 60.1 ± 13 years where, a study conducted by Irving ER et al. in suriname, reported the mean age of death due to cervical cancer as 58 ± 15 years [31]. 48/218 patients (22.02%) attained menopause at an age ≤ 40 years due to surgical or radiation treatment. In a study conducted by Michael Frumovitz et al. observed that the surgical treatment and irradiation resulted in menopausal symptoms in women treated with radiation and surgical methods, while the overall menopausal symptoms were significantly more bothersome for women received radiotherapy [32]. The impact of type of cervical cancer on the survival of the patients confirms the findings of Grigsby et al. who compared the survival of 101 patients with AC with that of 1138 patients with SCC treated during the same period and found no significant difference in overall disease-free survival [33].

Through the findings of our study, the age of patients showed a significant effect on QOL of patients, on the other hand, Osann et al. found no significant difference between the QOL of cervical survivors with different age groups [34]. A descriptive study conducted by Saishree Pradhan et al. in Regional Cancer Center, JIPMER, found no significant association between occupation status and QOL of patients [35].

Residence of the patients showed a greater impact on their QOL. Niresh Thapa et al. conducted a study using 256 patients with cervical cancer who visited Zhongnan Hospital of Wuhan University, concluded that the patients living in an urban area showed better QOL than patients from rural areas [36]. Patients with lowest educational level were associated with lowest QOL. Poor QOL due to low level of education was also reported by the studies done by Saishree Pradhan et al. and Sarikapan Wilailak et al. who found that higher levels

of education were related to higher QOL [35, 37]. However, Bradley et al. did not find any significant association between education and QOL [38].

Our study revealed that women in SES had poor QOL, the studies of Howard et al. and Schrijvers et al. stated that income was the measure for predicting QOL of patients [15, 39]. Yet, the studies conducted by Ann. L. Coker et al. and Saishree Pradhan et al. shown no significant effect of SES on QOL of cervical cancer patients [13, 35]. Stage of cancer at diagnosis had no significant impact on the QOL of patients, where T. Bindu et al. reported that patients in advanced stages such as stage III

and stage IV were more likely to be lost to follow-up when compared to patients with early stages, thus had poor QOL [40]. Our study showed that the patients without any social habits had good survival than patients with social habits like chewing tobacco, paan, smoking, having snuff and alcohol. The study of Waggoner SE et al. also stated that social habits predict worse overall survival in women with cervical cancer [41]. A study conducted by Ann. L. Coker et al. revealed that, the patients underwent hysterectomy had significantly better cervical cancer specific survival, where, the type of treatment in our study had no significant effect on the QOL of patients [13].

Table 4. Statistical representation of various factors affecting QOL

Factor	ECOG grade 0		ECOG grade 1-2		ECOG grade 3-4		P-value (χ^2 , df)
	n=36	%	n=93	%	n=60	%	
Age in years							
21-40	9	31.03	20	68.97	0	0	<.0001** (33.7, 4)
41-60	25	23.15	53	49.07	30	27.78	
61-80	2	3.85	20	38.46	30	57.69	
Occupation							
House wife	11	24.44	20	44.44	14	31.11	.013 [†] (12.6, 4)
Coolie	17	13.93	60	49.18	45	36.89	
Farmer	8	36.36	13	59.09	1	4.55	
Residence							
Rural	27	16.98	74	46.54	58	36.48	.005** (10.8, 2)
Urban	9	30	19	63.33	2	6.67	
Literacy							
Middle school and above	7	46.67	7	46.67	1	6.67	<.0001** (173, 4)
Primary	28	25.23	83	74.77	0	0	
Illiterate	1	1.59	3	4.76	59	93.65	
SES							
I	2	100	0	0	0	0	<.0001** (30.1, 8)
II	1	14.29	4	57.14	2	28.57	
III	19	35.19	28	51.85	7	12.96	
IV	14	11.97	56	47.86	47	40.17	
V	0	0	5	55.56	4	44.44	
Stage of cancer							
I	16	23.19	32	46.38	21	30.43	.194 (8.65, 4)
II	15	16.13	47	50.54	31	33.33	
III	5	22.73	13	59.09	4	18.18	
IV	0	0	1	20	4	80	
Social habits							
Yes	5	13.16	14	36.84	19	50	.026* (7.34, 2)
No	31	20.53	79	52.32	41	27.15	
Type of treatment							
Adjuvant RT+CT	25	21.93	53	46.49	36	31.58	.43(1.69, 2)
RT+CT, RT/CT	11	14.67	40	53.33	24	32	
Total (n=189)	36	19.05	93	49.2	60	31.75	

**; High statistical significant *; statistical significant

5. CONCLUSION

The lack of access to preventive and definitive care by the health care sectors, poor socioeconomic & educational status of the women and awareness regarding the disease and its treatment patterns resulted in poor follow up, low adherence to the treatment, which accentuated the cervical cancer burden. Cancer Awareness campaigns among the women, vaccination programs for teenage girls, early detection and employing See & Treat methods helps to combat the cervical cancer.

CONSENT

As per international standard, patient's informed written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

The study protocol was approved by Kakatiya Institutional Ethics Committee, Kakatiya Medical College, Warangal and the code of approval is KIEC/KMC/NCT/NIS/2018/P22.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the Department of Pharmacy Practice, BIPS, for being abundantly helpful and offering invaluable assistance support and guidance. We express our deepest gratitude to Dr. Meenakshi K, Raja N, Deepthi E and Dr. Srividya V for their suggestions in preparing the study protocol. We would like to thank Dr. Pratap Reddy B, Sister Nirmala, Dr. Nagalakshmi M and Dr. Swetha Reddy S for their support to conduct this study, we thank to Dr. Akhil Joseph P and Dr. Sourabh K for their valuable suggestions in statistical analysis. Special thanks go to the study participants.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Parkin DM, Pisani P, Ferlay J. Estimates of the worldwide incidence of 25 major cancers in 1990. *Int J Cancer*. 1999;80: 827-41.
2. WHO/ICO Information Centre on HPV and Cervical Cancer (HPV Information Centre). Summary report on HPV and cervical cancer statistics in India; 2007.
3. Dinshaw KA, Rao DN, Ganesh B. Tata memorial hospital cancer registry annual report. Mumbai, India: Department of Biostatistics and Epidemiology, Tata Memorial Hospital. 1999;52.
4. Aswathy S, Quereshi MA, Kurian B, Leelamoni K. Cervical cancer screening: Current knowledge & practice among women in a rural population of Kerala, India. *Indian J Med Res*. 2012;136:205-10.
5. Institute for Health Metrics and Evaluation. The Challenge Ahead: Progress in Breast and Cervical Cancer. Institute of Health Metrics and Evaluation; 2011. Available: [Http://www.healthmetricsandevaluation.org/publications/policyreport/challenge-ahead-progress-and-setbacks-breast-and-cervical-cancer](http://www.healthmetricsandevaluation.org/publications/policyreport/challenge-ahead-progress-and-setbacks-breast-and-cervical-cancer)
6. Sankaranarayanan R, Black R, Parkin D. eds., *Cancer survival in developing countries*, France. IARC Scientific Publications; 1998.
7. Wingo PA, Cardinez CJ, Landis SH, Greenlee RT, Ries LA, Anderson RN, et al. Longterm trends in cancer mortality in the United States, 1930 –1998. *Cancer*. 2003; 97(12):3133–75.
8. Romond EH, Perez EA, Bryant J, Suman VJ, Geyer CE Jr, Davidson NE, et al. Trastuzumab plus adjuvant chemotherapy for operable HER2-positive breast cancer. *N Engl J Med*. 2005;353:1673–84.
9. Jemal A, Siegel R, Ward E, Murray T, Xu J, Thun MJ. *Cancer statistics, 2007*. *CA Cancer J Clin*. 2007;57:43–66.
10. Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray, F. GLOBOCAN 2012 v1.0, *Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11* [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available: <http://globocan.iarc.fr>
11. Carmo CC, Luiz RR. Survival of a cohort of women with cervical cancer diagnosed in a Brazilian cancer center. *Rev Saúde Pública*. 2011;45:661-67.
12. Pardo C, Cendales R. Supervivencia de pacientes con cáncer de cuellouterino-tratadas en el Instituto Nacional de Cancerología. *Biomédica (Bogotá)*. 2009; 29:437-47.

13. Coker AL, Du XL, Fang S, Eggleston KS. Socioeconomic status and cervical cancer survival among older women: findings from the SEER-Medicare linked data cohorts. *Gynecol Oncol.* 2006;102(2):278-84.
14. Bishop A, Sherris J, Tsu VD, Kilbourne-Brook M. Cervical dysplasia treatment: Key issues for developing countries. *Bulletin of the Pan American Health Organization.* 1996;30:378–86.
15. Schrijvers CT, Mackenbach JP. Cancer patient survival by socioeconomic status in seven countries: A review for six common cancer sites [corrected]. *J Epidemiol Community Health.* 1994;48(5):441-46.
16. Nandakumar A, Anantha N, Venugopal TC. Incidence, mortality and survival in cancer of the cervix in Bangalore, India. *Br J Cancer.* 1995;71(6):1348-52.
17. Munagala R, Rai SN, Ganesharajah S, Bala N, Gupta RC. Clinicopathological, but not socio-demographic factors affect the prognosis in cervical carcinoma. *Oncol Rep.* 2010;24(2):511-20.
18. Akers AY, Newmann SJ, Smith JS. Factors underlying disparities in cervical cancer incidence, screening, and treatment in the United States. *Curr Probl Cancer.* 2007;31:157–81.
19. Jensen KE, Hannibal CG, Nielsen A, Jensen A, Nohr B, Munk C, et al. Social inequality and incidence of and survival from cancer of the female genital organs in a population-based study in Denmark, 1994-2003. *Eur J Cancer.* 2008;44:2003–17.
20. Louwman WJ, Aarts MJ, Houterman S, van Lenthe FJ, Coebergh JW, Janssen-Heijnen ML. A 50% higher prevalence of life-shortening chronic conditions among cancer patients with low socioeconomic status. *Br J Cancer.* 2010;103:1742–48.
21. Yeole BB, Kumar AV, Kurkureet A, Sunny L. Population-based survival from cancers of breast, cervix and ovary in women in Mumbai. *Asian Pac J Cancer Prev.* 2004; 5:308–15.
22. Porchia, Leonardo, Meda E, Zepeda Rossana, Orduña-Salazar AA, Juárez-Salazar et al. Different effects of the RNASEL R462Q mutation on the risk of developing prostate and cervical cancer in Latin American subjects: A meta-analysis. *J Carcinog Mutagen.* 2015;6:234.
23. Klee M, Thranov I, Machin D. Life after radiotherapy: The psychological and social effects experienced by women treated for advanced stages of cervical cancer. *Gynecol Oncol.* 2000;76:5-13.
24. Zubrod CG, Ipsen J, Frei E, Lasagna LC, Lipsett MB, Gehan E, Escher GC. Newer techniques and some problems in cooperative group studies. *Natl Cancer Inst Monogr.* 1960;3:277–92
25. Oken MM, Creech RH, Tormey DC, Horton J, Davis TE, Mc Fadden ET, et al. Toxicity and response criteria of the Eastern Cooperative Oncology Group. *Am J Clin Oncol.* 1982;5:649–55.
26. Sorensen JB, Klee M, Palshof T, Hansen HH. Performance status assessment in cancer patients. An inter-observer variability study. *Br J Cancer.* 1993;67(4): 773–75.
27. Roila F, Lupattelli M, Sassi M, Basurto C, Bracarda S, Picciafuoco M. Intra and interobserver variability in cancer patients' performance status assessed according to Karnofsky and ECOG scales. *Ann Oncol.* 1991;2:437–39.
28. Tulika Singh, Sanju Sharma, Seetharamiah Nagesh. Socio-economic status scales updated for 2017. *Int J Res Med Sci.* 2017;5(7):3264-67.
29. Fisher Exact Test – Physics. Available:www.physics.csbsju.edu/stats/exact.html
30. Koopmanschap MA, van Ineveld BM, Miltenburg TE. Costs of home care for advanced breast and cervical cancer in relation to cost-effectiveness of screening. *Soc. Sci. Med.* 1992;35(8)979-85.
31. Irving ER and Mans DRA. Age and Ethnic Differences in the Occurrence of Cervical Dysplasia, Cervical Cancer, and Cervical Cancer Deaths in Suriname. *Transl Biomed.* 2015;6:1.
32. Michael Frumovitz, Charlotte C. Sun, Leslie R. Schover, Mark F. Munsell, Anuja Jhingran, J. Taylor Wharton, et al. Quality of Life and Sexual Functioning in Cervical Cancer Survivors. *J Clin Oncol.* 2005; 23:7428-36.
33. Grigsby PW, Perez CA, Kuske RR, Camel HM, Kao MS, Galakatos AE, et al. Adenocarcinoma of the uterine cervix: Lack of evidence for a poor prognosis. *Radiother Oncol.* 1988;12:289-96.
34. Kathryn Osann, Susie Hsieh, Edward L. Nelson, Bradley J. Monk, Dana chase, David Cella, factors associated with poor quality of life among cervical cancer survivors: Implications for clinical care and

- clinical trials, *Gynecol Oncol.* 2014;135(2): 266-72.
35. Saishree Pradhan, Sonali Sarkar, Subitha Lakshminarayanan. Quality of life in cervical cancer patients on follow-up care in a regional cancer center in south India. *National Journal of Research in Community Medicine.* 2015;4:1:139-50.
36. Niresh Thapa, Muna Maharjan, YanXiong, Daqiong Jiang, Thi-Phuong Nguyen, Marcia A. Petrini. Impact of cervical cancer on quality of life of women in Hubei, China. *Scientific Reports.* 2018;8:11993.
37. Sarikapan Wilailak, Arb-aroon Lertkhachonsuk, Nawaporn Lohacharoenvanich, Suteera Chukkul Luengsukcharoen, Manmana Jirajaras, Puchong Likitanasombat, et al. Quality of life in gynecologic cancer survivors compared to healthy check-up women. *J Gynecol Oncol.* 2011;22(2)103-109.
38. Bradley S, Rose S, Lutgendorf S, Costanzo E, Anderson B. Quality of life and mental health in cervical and endometrial cancer survivors. *Gynecol. Oncol.* 2006;100(3):479-486.
39. Howard P. Greenwald, Ruth Mc Corkle, Kathy Baumgartner, Carolyn Gotay, Anne Victoria Neale. Quality of life and disparities among long-term cervical cancer survivors *J Cancer Surviv.* 2014; 8:419–26.
40. Bindu T, Kumar SS, Ratheesan K, Balasubramanian S. Factors associated with survival and lost to follow-up of cervical cancer patients in a tertiary cancer centre in rural Kerala. *Indian J Public Health.* 2017;61:43-46.
41. Waggoner SE, Darcy KM, Fuhrman B, Parham G, Lucci J 3rd, Monk BJ, et al. Association between cigarette smoking and prognosis in locally advanced cervical carcinoma treated with chemoradiation: A Gynecologic Oncology Group study. *Gynecol Oncol.* 2006;103(3)853-58.

© 2019 Lingappanoor et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle3.com/review-history/50625>