

ISSN 1996-3351

Asian Journal of
Biological
Sciences



Research Article

Pain Evaluation and Management among Cancer Patients in a Tertiary Care Setting in Nigeria: A Clinical Audit

¹Abdulgafar Olayiwola Jimoh, ²Usman Malami Aliyu, ³Abdulfatai Tomori Bakare, ¹Umar Muhammed Tukur, ¹Adamu Ahmed Adamu and ⁴Abdulmumin Salawudeen

¹Department of Pharmacology and Therapeutics, Faculty of Basic Clinical Sciences, College of Health Sciences, Usmanu Danfodiyo University (Teaching Hospital Complex) Sokoto, Nigeria

²Department of Radiotherapy and Oncology, Usmanu Danfodiyo University Teaching Hospital Sokoto, Nigeria

³Department of Psychiatry, Usmanu Danfodiyo University (Teaching Hospital Sokoto), Nigeria

⁴Faculty of Pharmaceutical Sciences, Usmanu Danfodiyo University Sokoto, Nigeria

Abstract

Background and Objective: Pain is one of the most common, unattended and unsolved problem for the cancer patients. Hence, this study aimed to examine the pain evaluation and management among cancer patients in the oncology unit of a Nigerian teaching hospital.

Materials and Methods: The study was a retrospective cross-sectional descriptive study of cancer pain patients seen and managed at Radiotherapy and Oncology Department of Usmanu Danfodiyo University Teaching Hospital, Sokoto from November, 2015 to October, 2016. The following data were extracted from 316 patients' record onto a preformed questionnaire: Patient's socio-demographic data, types of cancer diagnosed and their staging according to the Malignant Tumors Classification (TNM), mode of pain assessment, pain severity, treatment type and the analgesic drugs use profile. **Results:** The study included 316 patient records, males 127(40.2%) and 189 females (59.8%). The most prevalent 90 (28.5%) cancer type was breast cancer, 296 (93.7%) had adequately managed pain in line with the WHO Analgesic Step Ladder and Codeine was the most commonly (27.6%) prescribed analgesic. The most frequently prescribed analgesic combination Regimen was Codeine with Paracetamol. **Conclusion:** This study revealed a proper and objective pain assessment in line with standard references and adequate pain control which conforms to the WHO Analgesic Step Ladder guideline in a greater proportion of the study population.

Key words: Cancer pain, analgesic drugs, pain evaluation, tertiary care setting, malignant tumors, pain severity, codeine with paracetamol

Citation: Abdulgafar Olayiwola Jimoh, Usman Malami Aliyu, Abdulfatai Tomori Bakare, Umar Muhammed Tukur, Adamu Ahmed Adamu and Abdulmumin Salawudeen, 2018. Pain evaluation and management among cancer patients in a tertiary care setting in Nigeria: A clinical audit. Asian J. Biol. Sci., 11: 114-119.

Corresponding Author: Abdulgafar Olayiwola Jimoh, Department of Pharmacology and Therapeutics, Faculty of Basic Clinical Sciences, College of Health Sciences, Usmanu Danfodiyo University (Teaching Hospital Complex), Sokoto, Nigeria Tel: 08035950558

Copyright: © 2018 Abdulgafar Olayiwola Jimoh *et al.* This is an open access article distributed under the terms of the creative commons attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Pain is the most common and earliest complaint in most conditions including cancer, whereas pain cannot be adequately managed without a proper assessment and pain management starts with an objective assessment made at describing the severity to enable effective control. It is therefore important to find out if pain control is being provided in line with standards, so as to let care providers know where services are doing well or otherwise¹ with the overall aim of improving quality of life and optimizing patient care. This study therefore set out to audit the assessment and control of pain among cancer patient.

Pain is an unpleasant sensory and emotional experience that is usually associated with actual or potential tissue damage. Cancer pain can be defined as a complex sensation that reflects both damage to the body and the body's response to the damage². Pain is one of the most common, unattended and unsolved problem for the cancer patients. Major obstacles or barriers still exist that prevent reduction of pain in cancer patients³. Cancer is a major cause of death worldwide⁴. One consequence of cancer is pain which, in addition to suffering, decreases quality of life⁵. The World Health Organization (WHO) recommends that all painful patients should receive adequate analgesia and that effective pain control may be obtained in 90% of patients⁵. However, pain is still a poorly managed and neglected symptom by physicians and other health professionals worldwide⁶. The prevalence of pain among cancer patients is estimated between 25 and 50% for recently diagnosed patients, between 33 and 80% for patients being treated and approximately 75-100% for those in advanced or terminal stages⁷.

Pain is considered adequately managed when patients, after starting treatment, referred no pain or mild pain (VAS = 0-3)⁸. A major problem in managing pain is the difficulty to diagnose and measure it, WHO⁵ recommended that pain should be treated by steps guiding the therapeutic choice according to its intensity. To minimize the difficulties of evaluating pain, WHO and the International Association for the Study of Pain (IASP) have created tools (scales) aiming at establishing an international standard to translate a subjective symptom into objective data, thus guiding pain management⁸. Effective pain management is therefore a duty of all health professionals and a right of patients.

The above therefore underscores the urgent need to ensure an objective and adequate pain assessment and management among cancer patients. The study aimed at

retrospectively reviewing pain evaluation and management among cancer patients and compares both with standard recommended treatment guidelines.

MATERIALS AND METHODS

A retrospective cross-sectional descriptive study of records of cancer pain patients seen and managed at Radiotherapy and Oncology Department of Usmanu Danfodiyo University Teaching Hospital, Sokoto from November, 2015 to October, 2016. Inclusion criteria; all cancer pain patients with complete records attended to at the department. Exclusion criteria; cancer patients not managed for pain, cancer pain patients with incomplete records and those out of the study period.

The following data were extracted from each patient's record onto a preformed questionnaire: Patient's socio-demographic data, types of cancer diagnosed and staging according to the Malignant Tumors Classification (TNM), mode of pain assessment, pain severity, treatment type and the analgesic drugs use profile. The extracted information was analyzed using SPSS software and pain evaluation and management as seen in the enrolled subjects were compared to the WHO three steps analgesic ladder. Descriptive statistics was employed with results presented in tables and charts.

This study was approved by the Research and Projects Ethics Review Committee of the Usmanu Danfodiyo University Teaching Hospital Sokoto.

RESULTS

Demographic distribution: A total of 316 case records of cancer pain patients were enrolled in this study. Age range of patient's folder enrolled in the study ranges from 3-99 years, the mean age for male was 44.1 ± 15 years (range 3-99 years) and female was 45.1 ± 14 years (range 6-87 years). There were more females (59.8%) among the study subject and a sizeable number (85.4%) are married. Majority of the patients are Hausa (63.6%) by tribe, mostly House-wives (41.4%), a high percentage are Muslims (74.7%) and up to 25.6% had tertiary education (Table 1).

Cancer classification and staging: Breast cancer is the most frequent (28.5%) cancer diagnosed among the study population, followed by cervical (12.7%), soft tissue (10.1%), nasopharyngeal (5.1%), laryngeal (5.1%), colorectal (5.1%) and bone cancer (5.1%) in decreasing order. A summation of Stage III (40.8%), Stage II (26.9%) and Stage IV (24.4%) in

Table 1: Socio-demographic distribution of study population

Parameters	Frequency (%)
Age (years)	
0-9	4.00 (1.30)
10-19	10.00 (3.20)
20-29	32.00 (10.1)
30-39	51.00 (16.1)
40-49	84.00 (26.6)
50-59	61.00 (19.3)
60-69	54.00 (17.1)
70-79	18.00 (5.70)
80-89	1.00 (0.30)
90-99	1.00 (0.30)
Total	316.00 (100)
Age range (male)	3-99 years
Age range (female)	6-87 years
Mean \pm SD age (male)	44.1 \pm 15 years
Mean \pm SD age (female)	45.1 \pm 14 years
Gender	
Female	189.00 (59.8)
Male	127.00 (40.2)
Marital status	
Married	270.00 (85.4)
Single	34.00 (10.8)
Widow	12.00 (3.80)
Total	316.00 (100)
Occupation	
House wife	131.00 (41.4)
Civil servant	68.00 (21.5)
Business man	54.00 (17.0)
Farmer	27.00 (8.50)
Student	24.00 (7.60)
Under care	8.00 (2.50)
Teacher	4.00 (1.20)
Total	316.00 (100)
Religion	
Islam	236.00 (74.7)
Christianity	80.00 (25.3)
Total	316.00 (100)
Tribe	
Hausa	201.00 (63.6)
Igbo	39.00 (12.3)
Yoruba	18.00 (5.70)
Other	58.00 (18.4)
Total	316.00 (100)
Educational status	
Primary	6.00 (1.90)
Secondary	16.00 (5.10)
Tertiary	81.00 (25.6)
Qur'anic	97.00 (30.7)
Nil	100.00 (31.6)
Total	316.00 (100)

accordance with the TNM classification of cancer staging is the most frequent stages at presentation (Table 2).

Pain severity and control: Numeric rating scale was used to assess the cancer pain severity in all (100%) of the study population. In term of severity, moderate pain was the most frequently observed pain intensity (44.6%) in the study population which was mostly (94.2%) managed using drugs

in the step II, WHO three step analgesic ladder. Weak opioid accounted for about a third of analgesic used, with codeine as the most prescribed drug (in step II) in pain management. Majority of the analgesics prescribed (93.7%) in pain management are in conformity with WHO three steps analgesic ladder (Table 3).

Analgesics drug use: Codeine accounted for 27.6% of analgesics used while oral morphine and fentanyl were encountered in 7.9 and 2.1% of the total analgesic prescribed, respectively (Table 4). Codeine plus paracetamol were the most frequent (19.9%) combination regimen prescribed while tramadol plus ibuprofen were the least (2.85%) combination regimen encountered (Table 5).

DISCUSSION

This study revealed that a considerable proportion of the cancer patients in the study centre had adequate pain control in line with the standard recommended treatment guideline. Pain management is an integral part of comprehensive cancer care⁹ and requires specialized efforts¹⁰. In the present study, majority of the cancer patients were in the age group 40-49 years which replicates previous findings among cancer patients in other hospital across the globe¹¹⁻¹⁶. A study in India also reported 40-50 years of age as the leading age group among 384 patients with cancer and 63.5% were female¹⁷. Other non-cancer related studies reported mean age of 46.50 years with a higher population of female contrary to the finding in this study^{18,19} and reported more cases of cancer among male²⁰. Another study reported that cancer is commoner in elderly especially in those greater than 65 years which also contradicts what was reported in this study²¹.

Breast and cervical cancer were highly prevalent in this study, similar study in the centre has showed higher incidence of breast cancer and cervical cancer^{22,23}, but contrary to previous reports in which cervical cancer was the most frequent followed by breast cancer. It was reported that the Human Papillomavirus (HPV) plays a major etiologic role in the causation of cancer of the cervix^{24,25}. Nasopharyngeal cancer was reported as the commonest head and neck cancer which contradict current finding²².

It is important to note that 65.2% of cancer patients in this study presented at stages III and IV. A study reported that higher percentage (96%) of patients with cancer presented at advanced stage²⁶. This could be probably due to lack of effective screening and early detection services, in addition to inadequate public awareness campaign²⁷. A study described socio-economic, cultural and attitude as factors that cause late-stage presentation of breast carcinoma²⁸.

Table 2: Cancer classification with staging

Types	Staging									
	Stage I		Stage II		Stage III		Stage IV		Total	
	F	%	F	%	F	%	F	%	F	%
Breast cancer	6.0	6.70	24.0	26.70	29.0	32.20	31.0	34.40	90.0	28.50
Cervical cancer	2.0	5.00	7.0	17.50	25.0	62.50	6.0	15.00	40.0	12.70
Bladder cancer	1.0	14.30	3.0	42.90	1.0	14.30	2.0	28.60	7.0	2.20
Colorectal cancer	0.0	0.00	4.0	25.00	6.0	37.50	6.0	37.50	16.0	5.10
Nasopharyngeal cancer	0.0	0.00	5.0	31.30	8.0	50.00	3.0	18.70	16.0	5.10
Laryngeal cancer	1.0	6.30	6.0	37.50	7.0	43.70	2.0	12.50	16.0	5.10
Sinonasal cancer	1.0	16.70	1.0	16.70	4.0	66.60	0.0	0.00	6.0	1.90
Salivary cancer	2.0	15.40	4.0	30.70	5.0	38.50	2.0	15.40	13.0	4.10
Esophageal cancer	0.0	0.00	1.0	33.30	1.0	33.30	1.0	33.30	3.0	0.90
Oropharyngeal cancer	1.0	20.00	2.0	40.00	2.0	40.00	0.0	0.00	5.0	1.60
Prostate cancer	1.0	11.10	2.0	22.20	5.0	55.60	1.0	11.10	9.0	2.80
Soft tissue cancer	4.0	12.50	11.0	34.40	12.0	37.50	5.0	15.60	32.0	10.10
Liver cancer	0.0	0.00	0.0	0.00	1.0	100.00	0.0	0.00	1.0	0.30
Skin cancer	2.0	28.40	3.0	42.80	1.0	14.20	1.0	14.20	7.0	2.20
Hodgkin lymphoma	0.0	0.00	0.0	0.00	2.0	66.70	1.0	33.30	3.0	0.90
Brain cancer	1.0	8.30	2.0	16.60	7.0	58.30	2.0	16.60	12.0	3.80
Orbital cancer	1.0	20.00	2.0	40.00	0.0	0.00	2.0	40.00	5.0	1.60
Thyroid cancer	0.0	0.00	2.0	66.70	0.0	0.00	1.0	33.30	3.0	0.90
Bone cancer	1.0	6.30	4.0	25.00	7.0	43.70	4.0	25.00	16.0	5.10
Ovarian cancer	0.0	0.00	2.0	40.00	2.0	40.00	1.0	20.00	5.0	1.60
Kidney cancer	0.0	0.00	0.0	0.00	1.0	33.30	2.0	66.70	3.0	0.90
Lung cancer	0.0	0.00	0.0	0.00	1.0	50.00	1.0	50.00	2.0	0.60
Anal cancer	0.0	0.00	0.0	0.00	1.0	25.00	3.0	75.00	4.0	1.30
Uterine cancer	0.0	0.00	0.0	0.00	1.0	50.00	1.0	50.00	2.0	0.60
Total	24.0	7.60	85.0	26.90	129.0	40.80	78.0	24.40	316.0	100.00

F: Frequency

Table 3: Distribution of pain severity with WHO analgesic step ladder

Steps	WHO conformity											
	Mild		Moderate		Severe		Total		Yes		No	
	F	%	F	%	F	%	F	%	F	%	F	%
Step 1	113.00	91.20	10.00	8.10	1.0	0.80	124	100	113	91.2	11.0	8.8
Step 2	3.00	2.20	130.00	94.20	5.0	3.60	138	100	130	94.2	8.0	5.8
Step 3	0.00	0.00	1.00	1.90	53.0	98.10	54	100	53	98.1	1.0	1.9
Total	116.00	36.70	141.00	44.60	59.0	18.70	316	100	296	93.7	20.0	6.3

F: Frequency, Source: WHO⁵

Table 4: Distribution of analgesics prescribed

Analgesics	Frequency (%)
Codeine	119 (27.6)
Diclofenac	83 (19.3)
Paracetamol	76 (17.6)
Ibuprofen	54 (12.5)
Oral morphine	34 (7.9)
Piroxicam	26 (6.0)
Tramadol	19 (4.4)
Pentazocine	11 (2.6)
Fentanyl	9 (2.1)
Total	431 (100.0)

N = 431

This study examined the distribution of pain severity management based on WHO Analgesic Step Ladder.

Approximately 94% were adequately managed in conformity with WHO three step analgesic ladders. This is a higher proportion compared with what was reported earlier in which 74% were treated based on WHO Analgesic Step Ladder²⁹. In contrast to the findings in this study, reports from developed countries have shown a higher number of cancer patients whose pain was inadequately managed. A European study showed that 57.5% of patients were under medicated for cancer pain³⁰. In China, a study showed that 67% of patients were under medicated for cancer pain³¹. A Canadian study reported that 33.3% had inadequate pain management³².

Codeine and fentanyl were the most and the least prescribed analgesics in this study. According to WHO

Table 5: Pattern of analgesic combinations regimen prescribed

Analgesic regimen	Frequency (%)
Codeine+paracetamol	63 (19.9)
Codeine+diclofenac	20 (6.33)
Codeine only	36 (11.4)
Tramadol+diclofenac	10 (3.20)
Tramadol+ibuprofen	9.0 (2.85)
Diclofenac+paracetamol	13 (4.11)
Ibuprofen only	45 (14.2)
Diclofenac only	40 (12.7)
Oral morphine only	34 (10.8)
Piroxicam only	26 (8.20)
Pentazocine only	11 (3.48)
Fentanyl only	9.0 (2.85)
Total	316 (100)

guidelines, opioid analgesics are the mainstay of analgesic therapy and are classified according to their ability to control pain from mild to mild-moderate to moderate-severe intensity. The pattern of analgesic combination regimen prescribed shows that codeine and paracetamol/codeine and diclofenac were most prevalent. This finding also agreed with WHO guidelines for the treatment of cancer pain suggesting the type of analgesic that can be prescribed for pain that is normally mild, moderate or severe. Mild pain should be managed with a non-steroidal anti-inflammatory drug or acetaminophen. Weak opioids (e.g., codeine) should be prescribed for moderate-level pain and a strong opioid (e.g., morphine, hydromorphone, oxycodone, fentanyl) should be prescribed for severe pain^{33,34}.

CONCLUSION

A greater proportion of the patients had an objective and adequate pain assessment and management which conforms to the WHO Analgesic Step Ladder guideline. The reproduction of this study by other institutions may provide a need for promotion of optimal pain control and further insight into cancer pain management, thus improving cancer patients' care and quality of life.

SIGNIFICANCE STATEMENT

This study discovered that over 93% of the study population in the study centre had an objective and adequate pain assessment and management in line with standard recommended guideline that can be beneficial for the cancer patients experiencing pain in terms of improving quality of life. This types of study if replicated will help medical personnel's take stock of their practice and improve on areas of shortcoming.

REFERENCES

1. NHS England, 2018. The national clinical audit and patient outcomes programme (NCAPOP). <https://www.england.nhs.uk/clinaudit/>
2. Elumelu, T.N., A.A. Adenipekun, L.O. Eriba and B.I. Akinlade, 2014. Knowledge of cancer pain management among nurses in a Nigerian tertiary health institution. *J. Nurs. Educ. Pract.*, 4: 74-80.
3. Gehdoo, R.P., 2006. Cancer pain management. *Indian J. Anaesth.*, 50: 375-390.
4. WHO., 2007. Cancer Control: Knowledge into Action. WHO Guide for Effective Programmes, World Health Organization, Rome, Italy. <http://www.who.int/cancer/modules/en/>
5. WHO., 2007. WHO's Fight Against Cancer: Strategies that Prevent, Cure and Care. World Health Organization, Geneva, Switzerland.
6. WHO., 1996. Cancer Pain Relief: With a Guide to Opioid Availability. 2nd Edn., World Health Organization, Geneva, Switzerland, pp: 65.
7. Deandrea, S., M. Montanari, L. Moja and G. Apolone, 2008. Prevalence of undertreatment in cancer pain. A review of published literature. *Ann. Oncol.*, 19: 1985-1991.
8. Paice, J.A. and B. Ferrell, 2011. The management of cancer pain. *CA Cancer J. Clin.*, 61: 157-182.
9. De Lima, A.D., I.D.O. Maia, I. Costa Junior, J.T. de Oliveira Lima and L.C. Lima, 2013. Pain evaluation in cancer patients admitted to a teaching hospital of the Northeastern region of Brazil. *Rev. Dor. Sao Paulo*, 14: 267-271.
10. Portenoy, R.K. and E. Ahmed, 2014. Principles of opioid use in cancer pain. *J. Clin. Oncol.*, 32: 1662-1670.
11. Hökkä, M., P. Kaakinen and T. Pölkki, 2014. A systematic review: Non-pharmacological interventions in treating pain in patients with advanced cancer. *J. Adv. Nurs.*, 70: 1954-1969.
12. Afolayan, E., O. Ibrahim and G. Ayilara, 2012. Cancer patterns in Ilorin: An analysis of ilorin cancer registry statistics. *Trop. J. Health Sci.*, Vol. 19, No. 1.
13. Malami, S.A., U.H. Pindiga, B.A. Abimiku, I.A. Mungadi, A.D. Abdullahi, A. Dauda and S.M. Sahabi, 2007. a descriptive retrospective study of the pattern of malignant diseases in Sokoto, North Western Nigeria (1999-2004). *J. Med. Sci.*, 7: 1033-1038.
14. Aliyu, U.M., A.O. Jimoh, A. Yunusa and M. Umar, 2015. Pattern of cancers treated with radiotherapy in uduth sokoto: A new center experience. *J. Clin. Diagn. Res.*, 9: XC01-XC04.
15. Tegegn, H.G. and E.A. Gebreyohannes, 2017. Cancer pain management and pain interference with daily functioning among cancer patients in gondar university hospital. *Pain Res. Manage.*, Vol. 2017. 10.1155/2017/5698640.

16. Ovayolu, Ö., N. Ovayolu, S. Aytaç, S. Serçe and A. Sevinc, 2014. Pain in cancer patients: Pain assessment by patients and family caregivers and problems experienced by caregivers. *Support Care Cancer*, 23: 1857-1864.
17. Ezeome, E.R., 2010. Delays in presentation and treatment of breast cancer in Enugu, Nigeria. *Niger. J. Clin. Pract.*, 13: 311-316.
18. Singh, P. and A. Chaturvedi, 2015. Complementary and alternative medicine in cancer pain management: A systematic review. *Indian J. Palliat. Care*, 21: 105-115.
19. Jimoh, A.O., E.U. Etuk, Z. Sani and H.A. Shuaibu, 2011. The pattern of antibiotic use in a family medicine department of a tertiary hospital in Sokoto, North Western Nigeria. *J. Clin. Diagn. Res.*, 5: 566-569.
20. Jimoh, A.O., A.A. Sabir, A. Chika and Z. Sani, 2011. Pattern of antidiabetic drugs use in a diabetic outpatient clinic of a tertiary health institution in Sokoto, North-Western Nigeria. *J. Med. Sci.*, 11: 241-245.
21. Ferlay, J., 2001. GLOBOCAN 2000: Cancer Incidence, Mortality and Prevalence Worldwide. IARC Press, Lyon.
22. Sankaranarayanan, R., K. Ramadas and Y.L. Qiao, 2014. Managing the changing burden of cancer in Asia. *BMC Med.*, Vol. 12. 10.1186/1741-7015-12-3.
23. Iseh, K.R. and S.A. Malami, 2006. Pattern of head and neck cancer in Sokoto. *Niger. J. Otorhinolaryngol.*, 3: 77-83.
24. Jedy-Agba, E., M.P. Curado, O. Ogunbiyi, E. Oga and T. Fabowale *et al.*, 2012. Cancer incidence in Nigeria: A report from population-based cancer registries. *Int. J. Cancer Epidemiol.*, 36: e271-e278.
25. Brinton, L.A., 1991. Oral contraceptives and cervical neoplasia. *Contraception*, 43: 581-595.
26. Kyari, O., H. Nggada and A. Mairiga, 2004. Malignant tumours of female genital tract in North Eastern Nigeria. *East Afr. Med. J.*, 81: 142-145.
27. Siegel, R., E. Ward, O. Brawley and A. Jemal, 2011. Cancer statistics, 2011: The impact of eliminating socioeconomic and racial disparities on premature cancer deaths. *CA Cancer J. Clinicians*, 61: 212-236.
28. Parkin, D.M., J. Ferlay, M. Hamdi-Cherif, J.O. Thomas, H. Wabinga and S.L. Whelan, 2003. *Cancer in Africa: Epidemiology and Prevention*. IARC Scientific Publications No. 153. International Agency for Research on Cancer, Lyon, France, ISBN-13: 9789283221531, pp: 427.
29. Lannin, D.R., H.F. Mathews, J. Mitchell, M.S. Swanson, F.H. Swanson and M.S. Edwards, 1998. Influence of socioeconomic and cultural factors on racial differences in late-stage presentation of breast cancer. *Jama*, 279: 1801-1807.
30. Bernabei, R., G. Gambassi, K. Lapane, F. Landi and C. Gatsonis *et al.*, 1998. Management of pain in elderly patients with cancer. *J. Am. Med. Assoc.*, 279: 1877-1882.
31. Larue, F., S.M. Colleau, L. Brasseur and C.S. Cleeland, 1995. Multicentre study of cancer pain and its treatment in France. *Br. Med. J.*, 310: 1034-1037.
32. Wang, X.S., T.R. Mendoza, S.Z. Gao and C.S. Cleeland, 1996. The Chinese version of the brief pain inventory (BPI-C): Its development and use in a study of cancer pain. *Pain*, 67: 407-416.
33. Vuong, S., N. Pulenzas, C. DeAngelis, S. Torabi and S. Ahrari *et al.*, 2016. Inadequate pain management in cancer patients attending an outpatient palliative radiotherapy clinic. *Support Care Cancer*, 24: 887-892.
34. Ferreira, K.A.S.L., M. Kimura and M.J. Teixeira, 2006. The WHO analgesic ladder for cancer pain control, twenty years of use. How much pain relief does one get from using it? *Support Care Cancer*, 14: 1086-1093.