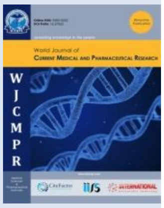
Research Article

World J Curr Med Pharm Res. 2025; 7(3): 15-21

World Journal of Current Medical and Pharmaceutical Research

Content available at www.wjcmpr.com ISSN: 2582-0222



A STUDY ON THE ROLE OF SOCIOECONOMIC AND EDUCATIONAL FACTORS IN CANCER PREVENTION, DIAGNOSIS AND TREATMENT OUTCOMS

Paspula Soumya[1]*, Pradeep Kumar Reddy[2], Billakanti Rajkumar[3], Faheemunnisa[4], Devulapally Dhanraj[5], Asma Tabassum[6]

[1]Assistant Professor, Department of Pharmacy Practice, Smt. Sarojini Ramulamma College of Pharmacy, (Palamuru University), Seshadri Nagar, Mahabubnagar District, Telangana State, India.

[2]Consultant medical oncologist and hemato-oncologist, Continental Hospitals: Hyderabad, Telangana, India

[3]Consultant Surgical Oncologist at Mahabubnagar Cancer Hospital and SVS Medical College and Hospital, Mahabubnagar.

[4]Pharm. D Intern, Smt. Sarojini Ramulamma College of Pharmacy, (Palamuru University), Seshadri Nagar, Mahabubnagar District, Telangana State, India.

ARTICLE HISTORY

Received on: 18-12-2026
Revised on: 03-01-2026
Accepted on: 25-01-2026

ABSTRACT

Cancer comprises a broad group of diseases characterised by uncontrolled cell growth with the potential to invade surrounding tissues and metastasise to distant organs, making it a leading cause of morbidity and mortality worldwide. Globally, cancer accounts for approximately 9.6 million deaths annually, ranking as the second leading cause of death. This study aims to explore and analyse the impact of socioeconomic and educational factors on cancer prevention, diagnosis, treatment acceptance, and overall patient outcomes. A mixed-methods approach was adopted, incorporating both quantitative and qualitative data. Quantitative data were collected using a structured questionnaire administered to cancer patients, capturing demographic variables such as age, gender, education level, income, employment status, and access to healthcare, along with information on prevention practices, diagnostic experiences, treatment acceptance, and clinical outcomes. The questionnaire also assessed health literacy, participation in screening programs, lifestyle modifications, willingness to undergo various treatment modalities, recovery time, survival, and quality of life. The findings underscore that individuals from lower socioeconomic and educational backgrounds experience significant barriers, including limited healthcare access, poor health awareness, delayed diagnosis, and reduced acceptance of standard treatments, leading to poorer outcomes. The study emphasises the necessity of targeted public health interventions, enhanced health education, and policy reforms to mitigate disparities and to improve cancer outcomes among vulnerable populations.

Keywords: *Socioeconomic disparities, educational factors, cancer prevention, Health literacy, Treatment Outcomes, Healthcare access barriers, public health interventions.*

***Corresponding Author**
Paspula Soumya

DOI: https://doi.org/10.37022/wjcmpr.v8i1.378

INTRODUCTION

Cancer remains one of the most significant public health challenges worldwide, characterized by uncontrolled cell growth, local invasion, and the potential to metastasize to distant organs [1, 2]. Despite major advances in early detection, diagnostic technologies, and therapeutic interventions, cancer continues to be a leading cause of morbidity and mortality across both developed and developing nations [3,4]. While biological and genetic factors play a crucial role in cancer development and progression, growing evidence indicates that social determinants of health—particularly socioeconomic status and educational attainment substantially influence cancer prevention, diagnosis, treatment decisions, and clinical outcomes [5-8].

Socioeconomic factors such as income level, employment status, health insurance coverage, and access to healthcare services strongly affect an individual's ability to engage in preventive behaviors, participate in screening programs, and obtain timely and appropriate medical care [9-12]. Individuals from lower socioeconomic backgrounds often experience barriers including limited access to healthcare facilities, financial constraints, and delayed medical consultations, which can result in late-stage diagnosis and poorer treatment outcomes. These disparities are especially pronounced in low- and middle-income populations, where healthcare infrastructure and affordability remain major challenges [13-17].

Educational status is another critical determinant influencing cancer-related outcomes. Higher levels of education are associated with improved health literacy, greater awareness of cancer risk factors, early warning signs, and the importance of routine screening and timely treatment. Conversely, limited education may contribute to misconceptions about cancer, fear of diagnosis, poor adherence to treatment regimens, and reliance on alternative or delayed care approaches. Such factors can negatively impact treatment acceptance and overall survival [18-20].

Understanding the combined influence of socioeconomic and educational factors is essential for developing effective cancer control strategies. This study aims to examine how these determinants affect cancer prevention practices, diagnostic pathways, treatment acceptance, and patient outcomes. By identifying key disparities, the findings may inform targeted public health interventions, health education programs, and policy initiatives designed to promote equitable cancer care and improve outcomes across diverse populations.

MATERIALS AND METHODS

Study Design, Type, and Duration

This study adopted a mixed-methods research design, integrating both quantitative and qualitative approaches to comprehensively assess the influence of socioeconomic and educational factors on cancer prevention, diagnosis, treatment acceptance, and patient outcomes. Quantitative data were collected using a structured questionnaire, while qualitative insights were obtained through semi-structured interviews. The study was conducted over a defined study period following ethical approval [21,22].

Study Setting and Source of Data

The study was conducted in the Department of Oncology at SVS Medical College and Hospital, Mahbubnagar. Data were collected from multiple sources, including patient case sheets, medication notes, structured questionnaires, and survey reports obtained directly from cancer patients receiving care at the institution.

Sample Size Determination

A total of 100 cancer patients were included in the study. The sample size was determined based on feasibility and the availability of eligible participants during the study period.

Sample Selection Criteria

Inclusion Criteria

- Adult patients aged 18 years and above with a confirmed diagnosis of cancer
- Patients diagnosed with different types of cancer, including breast, lung, colorectal, and prostate cancers
- Patients representing diverse socioeconomic backgrounds (low, middle, and high income)
- Patients with varying educational levels (primary, secondary, and tertiary education)
- Patients able to communicate in Hindi, Telugu, or Urdu

Exclusion Criteria

- Patients with severe cognitive impairment or dementia
- Patients with severe mental health conditions such as psychosis or major depressive disorders
- Patients unwilling or unable to provide informed consent
- Patients with incomplete or missing data related to socioeconomic or educational status

Methodology

Quantitative data were collected using a structured, pre-designed questionnaire developed specifically for cancer patients. The questionnaire captured demographic information, socioeconomic and educational status, healthcare access, cancer prevention practices, diagnostic experiences, treatment acceptance, and patient outcomes such as recovery time, survival, and quality of life. It also assessed patient attitudes toward cancer prevention, participation in screening programs, lifestyle modifications, and adherence to prescribed treatments.

Qualitative data were collected through semi-structured interviews conducted with selected cancer patients and healthcare professionals. These interviews explored personal experiences, perceived barriers to healthcare access, treatment decision-making processes, and the influence of socioeconomic and educational factors on cancer care and outcomes. The combination of quantitative and qualitative data provided a comprehensive understanding of the study objectives [23].

Study Procedure

The study commenced with an extensive literature review, followed by the development of the data collection tools. Ethical clearance was obtained from the Institutional Ethics Committee prior to participant recruitment. Eligible patients were selected using simple random sampling and enrolled after obtaining informed consent. Participants completed the questionnaire, and selected patients and healthcare providers participated in interviews. Qualitative data were analysed using thematic analysis, while quantitative data were statistically evaluated to identify meaningful associations. The findings were compiled and interpreted to formulate recommendations for improving cancer care [24].

Materials, Investigations, and Interventions

No additional investigations, interventions, or procedures beyond routine clinical care were performed on study participants. Data collection was limited to surveys and interviews.

Anticipated Risks and Risk Minimization

The study posed no anticipated physical or psychological risks to participants. Confidentiality and anonymity were strictly maintained, and participation was entirely voluntary.

Data Analysis Procedure

All eligible patients presenting to the oncology department during the study period were surveyed after obtaining consent. Demographic and cancer-related data were summarised using descriptive statistics. Associations between socioeconomic and educational factors and cancer-related outcomes were examined. Chi-square tests were used to evaluate relationships between categorical variables, and correlation analyses assessed the strength of associations. Qualitative responses were categorised into relevant themes such as healthcare barriers and the impact of education on cancer awareness.

Statistical Methods

Collected data were entered into Microsoft Excel and analyzed using appropriate statistical techniques. Descriptive statistics, including frequency distributions and mean ± standard deviation, were calculated. Inferential statistical methods such as logistic regression, multiple regression, chi-square tests, ANOVA, correlation analysis, and non-parametric tests (Mann–Whitney U test) were applied as required to examine relationships between variables [25,26].

Statistical Software

Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 23 and GraphPad Prism version 9.

Ethical Considerations

Ethical approval for the study was obtained from the Institutional Ethics Committee of SVS Medical College and Hospital before study initiation. Reference Number: IEC/DHR/-01/ (02/02)/2025/021/2

RESULTS AND DISCUSSION

During the six-month study period, data from 100 cancer patients were analysed to evaluate demographic characteristics, educational status, disease stage at diagnosis, socioeconomic status, treatment outcomes, and barriers to healthcare access.

Distribution of Patients Based on Age

The age-wise distribution of patients is summarised in Table 1 and illustrated in Figure 1. The majority of patients were aged 51–60 years (26%), with no participants below 20 years of age.

Table 01: Distribution of patients based on age

Age Group	Number of Patients	Percentage
< 20 Years	0	0%
21–30 Years	4	4.0%
31–40 Years	18	18.0%
41–50 Years	21	21.0%
51–60 Years	26	26.0%
61–70 Years	18	18.0%
71–80 Years	13	13.0%

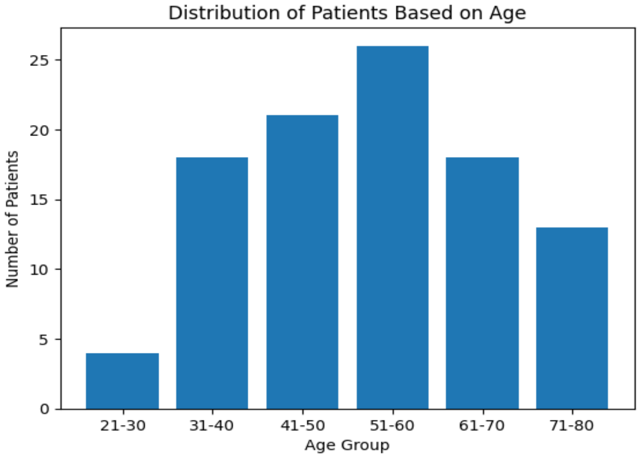


Figure 01: Bar graph showing age-wise distribution of patients

Distribution of Patients Based on Gender

Gender distribution of the study population is presented in Table 2 and depicted in Figure 2. Females constituted a higher proportion of patients (58%) compared to males (42%).

Table 02: Distribution of patients based on gender

Gender	Number of Patients	Percentage
Male	42	42%
Female	58	58%

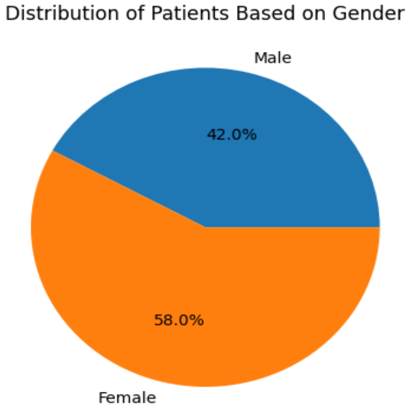


Figure 02: Pie chart representing gender distribution

Distribution of Patients Based on Educational Factors

Educational characteristics, including literacy, health literacy, cancer awareness, and participation in health education programs, are shown in Table 3 and visualised in Figure 3. Gaps were observed between general literacy and cancer-related awareness.

Table 03: Distribution of patients based on educational factors

Educational Factors	Yes	No
Literacy level	75	25
Health literacy	63	37
Awareness of cancer prevention and early detection	43	57
Participation in health education programs	33	67

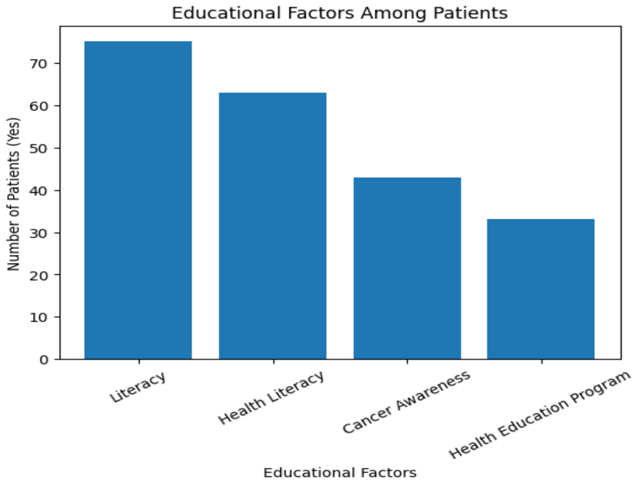


Figure 03: Bar graph illustrating educational factors

Distribution of Patients Based on Cancer Stage at Diagnosis

The stage of cancer at diagnosis is summarised in Table 4 and illustrated in Figure 4. Most patients were diagnosed at early stages (Stage I and II), though a notable proportion presented at advanced stages.

Table 04: Distribution of patients based on cancer stage at diagnosis

Cancer Stage	Number of Patients	Percentage
Stage I	33	33.0%
Stage II	26	26.0%
Stage III	28	28.0%
Stage IV	13	13.0%

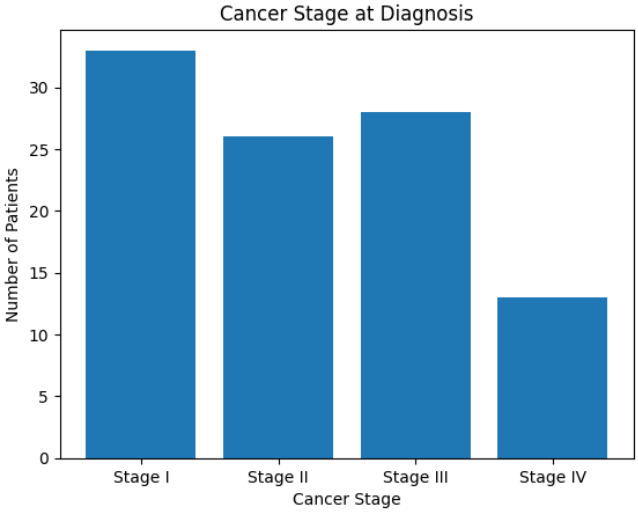


Figure 04: Bar chart depicting cancer stage at diagnosis

Socioeconomic Class-wise Distribution (Kuppuswamy Scale)

Socioeconomic status based on the modified Kuppuswamy scale is presented in Table 5 and shown graphically in Figure 5. Half of the patients belonged to lower socioeconomic groups, indicating substantial socioeconomic diversity.

Table 05: Socioeconomic class-wise distribution of patients

Class	Kuppuswamy Score	Number	Percentage	SES Group
I – Upper	26–29	0	0%	Not included
II – Upper Middle	16–25	5	5%	Higher SES
III – Lower Middle	11–15	45	45%	Higher SES
IV – Upper Lower	5–10	35	35%	Lower SES
V – Lower	<5	15	15%	Lower SES

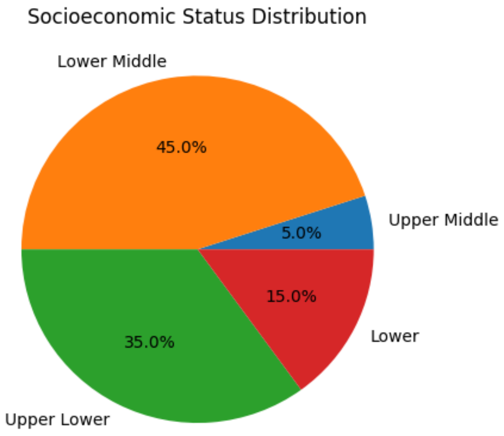


Figure 05: Pie chart showing socioeconomic class distribution

Treatment Outcomes Based on Socioeconomic Status

Treatment outcomes according to socioeconomic status are compared in Table 6. Patients from higher SES groups demonstrated better access to advanced treatments, higher adherence, fewer delays, and improved survival outcomes.

Table 06: Treatment outcomes based on socioeconomic status

Factor	Higher SES (n = 50)	Lower SES (n = 50)
Access to Advanced Treatment	42 (84%) received chemotherapy/immunotherapy/targeted therapy	17 (34%) received advanced treatment
Insurance Coverage	47 (94%) had private/comprehensive insurance	30 (60%) had public or inadequate insurance
Treatment Delays	3 (6%) experienced delays	20 (40%) experienced delays
Treatment Adherence	48 (96%) adhered regularly	28 (56%) adhered regularly
Survival / Stable Disease	44 (88%) in remission or stable	27 (54%) with positive outcomes
Social Support Systems	46 (92%) reported strong support	23 (46%) reported adequate support
Overall Positive Outcomes	43 (86%) favourable outcomes	27 (54%) favourable outcomes

The association between socioeconomic status and treatment-related variables was statistically analysed using Chi-square tests, as shown in Table 7, revealing significant associations ($p < 0.001$).

Table 07: Chi-square analysis of socioeconomic status and treatment outcomes

Outcome Variable	Higher SES (n=50)	Lower SES (n=50)	Chi-square	df	p-value	Statistical Significance
Survival Outcome	44 stables vs. 6 poor	27 stables vs. 23 poor	14.02	1	< 0.001	Significant
Treatment Adherence	48 adherents	28 adherents	21.92			Highly significant
Treatment Delays	3 delayed	20 delayed	16.32			Significant
Insurance Type	47 privates	15 privates	43.46			Highly significant

Barriers to Healthcare Access Based on Socioeconomic Status

Barriers to healthcare access experienced by patients across socioeconomic groups are summarized in Table 8. Lower SES patients faced greater financial, geographic, technological, and sociocultural barriers compared to higher SES patients.

Table 08: Barriers to healthcare access based on socioeconomic status

Barrier Type	Higher Socioeconomic Status (50 Patients)	Lower Socioeconomic Status (50 Patients)
Cost of Treatment	Only 3 patients faced financial barriers, with most treatments covered by insurance or personal savings.	30 patients struggled with high out-of-pocket costs, leading to postponed treatments or reliance on less expensive options.
Insurance Coverage	47 patients had comprehensive insurance, ensuring access to cutting-edge therapies and frequent screenings.	25 patients had inadequate insurance, leading to underreporting of cancer symptoms and delays in treatment.
Geographic Barriers	All patients had easy access to healthcare centres, with 50 living within a 30-minute drive of specialized facilities.	17 patients lived in rural areas or underserved regions, with some needing to travel 2-4 hours for specialized care.
Telemedicine Access	50 patients had access to telemedicine due to reliable internet and devices, allowing for consultations and follow-up care.	17 patients lacked reliable internet access, making telemedicine difficult and increasing the need for in-person visits.
Work and Family Commitments	48 patients were able to take time off work for treatment and had family members who could provide care.	23 patients faced challenges in attending appointments due to work schedules or lack of childcare.
Cultural and Language Barriers	50 patients had no significant cultural or language barriers when interacting with healthcare providers.	13 patients faced cultural or language barriers that affected their understanding of treatment plans, leading to miscommunication and delays.

CONCLUSION

This study highlights the pivotal role of socioeconomic status and educational attainment in shaping outcomes across the cancer care continuum, including prevention, early diagnosis, treatment access, adherence, and survival. Patients with higher socioeconomic status and better education demonstrated greater health literacy, improved awareness of cancer prevention and screening, timely diagnosis, consistent treatment adherence, and superior clinical outcomes. In contrast, individuals from lower socioeconomic backgrounds experienced multiple barriers such as financial constraints, inadequate insurance coverage, limited healthcare accessibility, and reduced participation in health education programs, leading to delayed diagnosis and poorer outcomes. The findings emphasise that disparities in cancer care are not solely biologically driven but are strongly influenced by social and structural determinants of health. Addressing these inequities requires a comprehensive approach that integrates health education, improved access to affordable care, and supportive healthcare policies. Overall, the study underscores the urgent need for targeted public health strategies to reduce socioeconomic and educational disparities and to ensure equitable, timely, and effective cancer care for all populations.

Limitations and Recommendations

The present study has certain limitations that should be considered when interpreting the findings. The relatively small sample size of 100 patients may limit the generalizability of the results. As a single-centre study conducted at SVS Medical College and Hospital, Mahbubnagar, regional healthcare practices and population characteristics may have influenced the outcomes. Geographic confinement further restricts applicability to other regions with different socioeconomic and cultural contexts. Potential biases, including self-reported data, recall bias, and interviewer bias, may have affected data accuracy. Additionally, while qualitative data were collected, greater methodological detail could strengthen interpretative rigour.Future research should include larger, multi-centre studies to enhance representativeness and external validity. Strengthening qualitative analysis methods, minimising bias through standardised tools, and ensuring strict ethical compliance are essential. Policymakers should focus on improving health literacy, expanding insurance coverage, and strengthening community-based cancer education and support systems.

FUNDING

Nil

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this paper.

ACKNOWLEDGMENT

We also thank the patients who consented to participate in this research.

AUTHOR CONTRIBUTIONS

Paspula Soumya conceived and designed the study, supervised the research work, and drafted the manuscript. Faheemunnisa, Devulapally Dhanraj, and Asma Tabassum contributed to data collection, analysis, and manuscript preparation. All authors reviewed and approved the final version of the manuscript.

Ethical Statement

Ethical clearance was obtained from the Institutional Ethics Committee of SVS Medical College and Hospital, Mahbubnagar, before the initiation of the study (Reference number: IEC/DHR-01/ (02/02)/2025/021/2

REFERENCES

1. World Health Organization. Cancer [Internet]. Geneva: WHO; [cited 2026 Feb 11]. Available from: https://www.who.int/health-topics/cancer
2. National Cancer Institute. Chromosome [Internet]. NCI Dictionary of Genetics Terms; [cited 2026 Feb 11]. Available from: https://www.cancer.gov/publications/dictionaries/genetics-dictionary/def/chromosome
3. Sirin SR. Socioeconomic status and academic achievement: a meta-analytic review of research. Rev Educ Res. 2005;75(3):417–453. doi:10.3102/00346543075003417
4. Gupta B, Ariyawardana A, Johnson NW. Oral cancer in India continues in epidemic proportions: evidence base and policy initiatives. Int Dent J. 2013;63(1):12–25. doi:10.1111/j.1875-595X.2012.00131.x
5. Sankaranarayanan R, Ramadas K, Thara S, Muwonge R, Thomas G, Anju G, et al. Long-term effect of visual screening on oral cancer incidence and mortality in a randomized trial in Kerala, India. Oral Oncol. 2013;49(4):314–321. doi:10.1016/j.oraloncology.2012.11.004
6. Desai S, Kulkarni V. Changing educational inequalities in India in the context of affirmative action. Demography. 2008;45(2):245–270. doi:10.1353/dem.0.0001
7. Ghosh SS. Assessing the Impact of Socioeconomic Factors on Educational Equity in Indian Primary Schools: A Structural Modelling Perspective. Measurement: Interdisciplinary Research and Perspectives. 2024 Apr 5;1–11.
8. National Cancer Institute. Types of cancer A to Z list of cancer types [Internet]. [cited 2026 Feb 11]. Available from: https://www.cancer.gov/about-cancer/understanding/what-is-cancer
9. Cooper GM. The development and causes of cancer. In: The cell: a molecular approach. 2nd ed. Sunderland (MA): Sinauer Associates; 2000. Available from: https://www.ncbi.nlm.nih.gov/books/NBK9963/
10. Mayo Clinic. Cancer: symptoms and causes [Internet]. [cited 2026 Feb 11]. Available from: https://www.mayoclinic.org/diseases-conditions/cancer/symptoms-causes/syc-20370588
11. Neta G, Sanchez MA, Chambers DA, et al. Implementation science in cancer prevention and control: a decade of grant funding by the National Cancer Institute and future directions. Implement Sci. 2015;10:4. doi:10.1186/s13012-014-0200-2

12. Siegel RL, Giaquinto AN, Jemal A. Cancer statistics, 2024. CA Cancer J Clin. 2024;74(1):1–114. doi:10.3322/caac.2182
13. Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, et al. Global Cancer Observatory: Cancer Today [Internet]. Lyon (France): International Agency for Research on Cancer; 2018 [cited 2026 Feb 11]. Available from: https://gco.iarc.fr/today
14. Lu W, Rosenthal DS. Oncology acupuncture for chronic pain in cancer survivors: a reflection on the American Society of Clinical Oncology chronic pain guideline. Hematol Oncol Clin North Am. 2018;32(3):519–533. doi:10.1016/j.hoc.2018.01.009
15. Linsinga ML, Singh B, Rose GL, Clifford BK, Bailey TG, Spence RR, et al. The effect of exercise on pain in people with cancer: a systematic review with meta-analysis. Sports Med. 2023;53(9):1737–1752. doi:10.1007/s40279-023-01862-9
16. Goodlev ER, Discala S, Darnall BD, Hanson M, Petok A, Silverman M. Managing cancer pain, monitoring for cancer recurrence, and mitigating risk of opioid-use disorders: a team-based, interdisciplinary approach to cancer survivorship. J Palliat Med. 2019;22(11):1308–1317. doi:10.1089/jpm.2019.0171
17. Hamlish T, Pasquinelli M, Gastala N, Huber M, Manst D, Andersen K, et al. A team-based approach to effective management of pain and opioid use disorder in patients with cancer: Case report. Current Problems in Cancer: Case Reports [Internet]. 2022 Dec 1 [cited 2023 Dec 3];8:100196
18. Ye L, Li YH, Huang YH, Deng QC, Huang YX, Peng YH, et al. Effectiveness of non-pharmacological interventions for pain management in patients with cancer:a protocol for systematic review and network meta-analysis. BMJ open [Internet]. 2024 Jan;14(10)
19. Mathew A, George PS, Kunnambath R, Mathew BS, Kumar A, Syampramod R, et al. Educational status, cancer stage, and survival in South India: a population-based study. JCO Glob Oncol. 2020;6:1704–1711. doi:10.1200/GO.20.00259
20. Fitzmaurice C, Akinyemiju TF, Al Lami FH, et al. Global, regional, and national cancer incidence, mortality, years of life lost, years lived with disability, and disability-adjusted life-years for 29 cancer groups, 1990–2016: a systematic analysis for the Global Burden of Disease Study. JAMA Oncol. 2018;4(11):1553–1568. doi:10.1001/jamaoncol.2018.2706
21. Tanskanen T, Seppä KJ, Virtanen A, et al. Cancer incidence and mortality in the oldest old: a nationwide study in Finland. Am J Epidemiol. 2021;190(5):836–842. doi:10.1093/aje/kwaa236
22. Kerr J, Anderson C, Lippman SM. Physical activity, sedentary behaviour, diet, and cancer: an update and emerging new evidence. Lancet Oncol. 2017;18(8):e457–e471. doi:10.1016/S1470-2045(17)30411-4
23. Dahlgren G, Whitehead M. The Dahlgren-Whitehead model of health determinants: 30 years on and still chasing rainbows. Public Health. 2021;199:20–24. doi:10.1016/j.puhe.2021.08.009
24. Bray F, Laversanne M, Weiderpass E, Soerjomataram I. The ever-increasing importance of cancer as a leading cause of premature death worldwide. Cancer. 2021;127(16):3029–3030. doi:10.1002/cncr.33587
25. Preda A, Voigt K. The social determinants of health: why should we care? Am J Bioeth. 2015;15(3):25–36. doi:10.1080/15265161.2014.998374
26. Dreyer MS, Nattinger AB, McGinley EL, et al. Socioeconomic status and breast cancer treatment. Breast Cancer Res Treat. 2018;167(1):1–8. doi:10.1007/s10549-017-4490-3