

Assessing Health Literacy, Learning Needs, and Patient Satisfaction in Cancer Care: A Holistic Study in the Omani Context

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Abstract

Background: Health literacy is essential in cancer care, affecting patient outcomes, perception, and involvement in healthcare decisions. **Purpose:** This study aimed to evaluate and identify gaps and relationships between the levels of health literacy, learning needs, and satisfaction with educational activities among cancer patients in Oman. **Methods:** A cross-sectional study was conducted among 323 cancer patients at the Sultan Qaboos Comprehensive Cancer Center, University Medical City, in Muscat, Oman. Data were collected using a self-administered questionnaire, which measured health literacy using the Health Literacy Instrument for Adults (HELIA), assessed learning needs based on importance, and evaluated satisfaction with educational activities. Descriptive statistics and correlation analyses were conducted using SPSS version 23 to identify relationships between the variables. **Results:** The average health literacy score was 4.36, indicating a generally high level of health literacy among the participants. Learning needs were highest for chemotherapy and hormonal therapy (mean = 4.65), while satisfaction with education activities was highest for overall experience (mean = 4.38). However, there were notable gaps between the perceived importance of learning needs and satisfaction with educational activities, particularly in chemotherapy and hormonal therapy (gap = 0.46). A moderate positive correlation was found between health literacy and learning needs ($r = 0.341$, $p = 0.022$), while a stronger positive correlation existed between health literacy and satisfaction with educational activities ($r = 0.58$, $p < 0.00001$). **Conclusion:** Improving health literacy and addressing gaps in learning needs and educational satisfaction are crucial for enhancing cancer care outcomes and patient satisfaction in Oman.

Keywords: Health Literacy- Learning Needs- Patient Satisfaction- Omani Context- Gap analysis- SQCCRC

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Introduction

Health literacy is considered a critical element in the proper management of cancer. It is defined as the ability of individuals to get, manage, and understand the basic health information and required services to make

correct health decisions. In cancer care, health literacy can significantly affect patient outcomes in all patient journeys, from early detection and diagnosis to treatment and survivorship. Patients with minimal health literacy

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may always face challenges in using and utilizing the healthcare system, causing delays in diagnosis and starting treatment, improper understanding of their disease, and underutilization of preventive measures such as screening [1].

Moreover, minimal health literacy can affect patient-provider communication, causing misunderstandings of treatment plans and decreased adherence and compliance with planned treatment. This can further increase health disparities, especially among high-risk and socioeconomically disadvantaged groups who have a high risk of poor cancer prognosis and outcomes. So, the efforts to enhance health literacy in cancer care are critical. These include training healthcare providers in effective communication strategies, developing clear and accessible educational materials, and implementing health literacy interventions consistent with the learning needs of cancer patients [2].

Learning needs assessment is considered the main component in cancer management since it identifies the specific educational requirements of patients, facilities tailoring information, and support by health professionals. This patient-centered approach ensures that patients understand their diagnosis, treatment options, and potential side effects, which can significantly improve their ability to make proper decisions and adhere to treatment plans [3].

Addressing cancer patients' learning needs can improve their overall experience, decrease anxiety, and enhance outcomes by enhancing communication and engagement between patients and healthcare teams [4]. Evidence-based needs assessment tools and strategies are essential for delivering high-quality, patient-centered cancer care [5].

Patient satisfaction plays a vital role in the education process in the health care setting. When patients are well-informed about their preventive measures, health conditions, and treatment options, they are more likely to feel engaged and empowered in their care, leading to higher satisfaction levels [6]. It improves patient adherence to treatment plans and compliance with medical instruction, improves health outcomes, and enhances communication between patients and healthcare providers [7]. Evidenced-based and structured patient education helps build trust and ensures that patients are actively participating in their healthcare journey, which leads to an improved, positive healthcare experience [8].

The Omani cancer care context is characterized by a comprehensive and evolving healthcare system aimed at addressing the rising incidence of cancer. Oman has implemented a national Non-Communicable Diseases (NCD) action plan, which includes cancer prevention and control strategies [9]. The country offers integrated cancer care services, including a cancer registry and control program under the Directorate General of Non-Communicable Diseases at the Ministry of Health [9]. Additionally, Oman has developed a long-term healthcare vision, "Health Vision 2050," which emphasizes patient empowerment, public awareness, health education, and the integration of services [9]. This vision aims to enhance

cancer care through early detection, screening programs, and partnerships with non-governmental organizations (NGOs) and the private sector [9].

Research in health literacy and patient education among oncology patients in Oman shows several critical areas requiring more attention [10]. Firstly, there is a lack of comprehensive studies that explain the specific health literacy levels within the Omani oncology patient population among different demographic groups [11]. This gap makes it difficult to develop targeted educational interventions consistent with the unique needs of these patients. Additionally, there is limited research on the outcome of current patient education programs in improving patient experience and satisfaction [12]. Another significant gap is the improper identification of e-health literacy and the potential of technology-based educational tools, which could be beneficial in improving patient perception and engagement in a rapidly developing healthcare environment [13].

Accordingly, the study aims to comprehensively evaluate the levels of health literacy among cancer patients in Oman, identify their specific learning needs, and measure their satisfaction with the care they receive. This study aims to provide insights into how well patients understand their health conditions and treatment options, which can inform the development of targeted educational interventions. By addressing these aspects, the study seeks to enhance patient engagement, improve adherence to treatment plans, and ultimately lead to better health outcomes. Additionally, the findings can guide healthcare providers and policymakers in creating more patient-centered and culturally sensitive cancer care strategies.

Methods

Setting and Desing

The study was conducted at the Sultan Qaboos Comprehensive Cancer Center, University Medical City, in Muscat, Oman. A cross-sectional design assessed health literacy, learning needs, and patient satisfaction among cancer patients. This approach allows for data collection at a single point in time, providing a snapshot of the current state of these variables within the specified population.

Sampling

The population for this study consisted of cancer patients receiving treatment at the Sultan Qaboos Comprehensive Cancer Center (SQCCRC) in Muscat, Oman. Participants of the study needed to meet the following inclusion criteria:

- Diagnosed with cancer.
- Receiving treatment at the SQCCRC.
- Willingness to participate and able to complete the survey online.

A convenience sampling approach was employed to select participants for the study to recruit a representative sample size of 323 patients. This sample size was chosen based on a 95% confidence level and a 5% margin of error.

Instrument

A meticulously designed self-reported questionnaire was employed to capture the study's objectives' multifaceted dimensions comprehensively. This questionnaire encompassed distinct sections:

- **Demographic Information:** Participants provided essential demographic details, including age, gender, region, job status, marital status, diagnosis, diagnosis date, and current treatment.

- **Health Literacy Assessment:** The Health Literacy Instrument for Adults (HELIA) was used to assess the study cohort. HELIA is composed of 33 items that evaluate the individual's reading, access to information, understanding, appraisal, and decision-making/intention to change, with a scoring system ranking health literacy on a scale ranging from 0 (inadequate) to 100 (excellent) health literacy [13]

- **Needs Assessment Questionnaire:** A self-reporting survey questionnaire covered the following domains: 1) psychosocial, 2) information, 3) daily physical, 4) patient care and support, and 5) interpersonal and communication. Respondents rated the importance of information relating to these domains on a 5-point Likert scale (1 = not important, 2 = slightly important, 3 = neutral, 4 = important, and 5 = very important). Patients were given the needs assessment questionnaire in a language of their preference (either Arabic or English). The items were derived from Chua (2018) [14].

- **Satisfaction with Information:** Satisfaction with the information provided by SQCCRC staff on each domain of informational need was assessed using a 5-point Likert scale (1 = very dissatisfied, 2 = dissatisfied, 3 = neither satisfied nor dissatisfied, 4 = satisfied, and 5 = very satisfied). The difference between perceived importance and satisfaction was considered an indicator of gaps in information delivery. The items were derived from Chua (2018) [14]

Data Collection and Analysis

After obtaining approval from the Institutional Review Board (IRB) at the Sultan Qaboos Comprehensive Cancer Center (SQCCRC), potential participants were recruited face-to-face by the research team using an information statement. If the patient agreed to participate, an invitation letter with the information statement was sent through WhatsApp participants who agreed to participate completed and submitted the self-administered questionnaire. Descriptive statistics and correlation analyses were used to explore the interplay between the variables using SPSS version 23.

Ethical Considerations

Ethical approval was obtained from the institutional review board. All participants' privacy and confidentiality were strictly maintained throughout the study. The cover page included the study goal, eligibility criteria, risks, and benefits. If participants filled out the attached questionnaire, it implied their consent to participate in the study.

Results

Table 1 presents demographics and clinic characteristics. The sample ranged from 19 to 86 years, while the average was 45.81 years with a standard deviation of 15.55 years. In the gender category, 182 patients (56.35%) are female. The largest group consisted of patients with a secondary school education (n = 88, 27.24%).

For occupation, most patients were employed (n = 116, 35.91%) and married (n = 239, 73.99%) were married. In terms of clinical characteristics, most patients were diagnosed with rare tumors (n = 107, 33.13%), including sarcoma. Regarding time since diagnosis, most patients had been diagnosed for over a year (n = 193, 59.75%) and on treatment (n = 197, 60.99%). Lastly, miscellaneous treatments were the most common treatment modalities (n = 128, 39.63%).

Table 2 presents mean scores and standard deviations (SD) for Health Literacy, Learning Need Assessment (Importance), and Satisfaction with Education Activities. In the Health Literacy variable, the highest mean score was for "Understanding" domains (mean = 4.43, SD = 0.61), meaning that patients generally found this area to be the most developed. The lowest score was for "Appraisal" (mean = 4.00, SD = 0.84). The average total score for health literacy was 4.36 (SD = 0.56), indicating a high level of health literacy among patients.

For the Learning Need Assessment (Importance), the "Chemotherapy/Hormonal Therapy" domain had the highest importance score (mean = 4.65, SD = 0.74). The "Clinical Trials" domain had the lowest importance (mean = 4.15, SD = 1.06). The total score for learning need assessment was 4.53 (SD = 0.60), showing a high perception of learning needs importance in most areas.

In the Satisfaction with Education Activities category, participants were most satisfied with the education regarding "Overall Experience" (mean = 4.38, SD = 0.77), while "Clinical Trials" had the lowest satisfaction score (mean = 3.90, SD = 1.01). The overall total score for satisfaction with education activities was 4.25 (SD = 0.70), indicating a generally positive but variable satisfaction level across different care education areas.

Table 3 shows gaps in learning needs among patients by comparing the importance of learning needs and satisfaction with provided educational activities. These gaps are defined when the perceived importance of learning exceeds the satisfaction with the provided education.

The most significant gap was seen in "Chemotherapy/Hormonal Therapy" (0.46), meaning a substantial difference between how essential patients considered learning needs in this area and how satisfied they were with the provided education. "Supportive Care" (0.39), "Psychosocial aspect of care" (0.38), and "Sexual aspect of Care" (0.38) also had significant differences.

The smallest gap was seen in "Diagnosis" (0.07), meaning that satisfaction with education regarding diagnosis was closely aligned with its perceived importance. The total score for gaps across all areas was 0.28, indicating a moderate difference between the

Table 1. Demographics and Clinic Characteristics

Category	Variable	Mean (Range)	SD
Age		45.81 (19 to 86)	15.55
		Frequency	Percentage (%)
Gender	Female	182	56.35
	Male	141	43.65
Education Level	Other	2	0.62
	Primary School	52	16.10
	Secondary School	88	27.24
	Diploma Degree	60	18.58
	Bachelor Degree	73	22.60
	Master Degree	23	7.12
	Doctorate	4	1.24
Occupation	Business Man	1	0.31
	Employee	116	35.91
	Housewife	1	0.31
	Housewife	24	7.43
	Retired	67	20.74
	Student	18	5.57
	Unable to work	1	0.31
	Unemployed	94	29.10
	Widow	1	0.31
Marital Status	Divorced	9	2.79
	Married	239	73.99
	Single	55	17.03
	Widow	20	6.19
Cancer Type	Breast Cancer	67	20.74
	Gastrointestinal Cancer	63	19.50
	Head, Neck, and Thoratic Cavity Cancer	14	4.33
	Rare Tumors	114	35.30
	Urinary Tract Cancer	29	8.98
	Women Health Cancer	25	7.74
Time Since Diagnosis	Others	9	2.79
	<3 months	26	8.05
	3-12 months	95	29.41
	> 1 year	193	59.75
Treatment Status	Newly diagnosed	18	5.57
	Off treatment	108	33.44
	On treatment	197	60.99
Treatment Modalities	Chemotherapy	77	23.84
	Follow-up	4	1.24
	Hormonal	19	5.88
	Immunotherapy	5	1.55
	Miscellaneous	128	39.63
	Radiation	45	13.93
	Surgery	45	13.93

importance of learning needs and satisfaction with the education provided.

Study variables were analyzed using correlation coefficients (r) and p-values in Table 4. The results showed a moderately significant positive correlation ($r = 0.341$, $p \text{ value} = 0.022$) between the Health Literacy Total Score and the Learning Need Assessment.

Moreover, the results showed a stronger significant positive correlation ($r = 0.58$, $p \text{ value} < 0.00001$) between Health Literacy and Satisfaction with Education. Finally, the results showed that the correlation between Satisfaction with Education Activities and Learning Needs is also strong and positive ($r = 0.597$, $p < 0.00001$).

Discussion

Health literacy plays a crucial role in cancer care by influencing how effectively patients can engage with healthcare providers, understand their diagnoses, and navigate complex treatment plans. High levels of health literacy empower patients to be active participants in their care, enabling them to comprehend medical information, ask critical questions, and make informed decisions about their health. Research indicates that patients with greater

health literacy tend to exhibit improved adherence to prescribed treatments, reduced anxiety, and higher levels of satisfaction with care outcomes. Furthermore, these patients are more likely to understand how to prevent complications and manage side effects, contributing to long-term positive health outcomes. In Oman, where cancer care has become a focal point of the national health agenda, addressing health literacy gaps can substantially improve patient engagement and treatment outcomes, especially as the healthcare system continues to modernize.

The connection between health literacy and the ability of patients to identify their learning needs is well documented. Patients with high health literacy proactively seek information to fill gaps in their knowledge, enabling them to better understand their conditions and explore treatment options [3]. They are more likely to identify potential risks, side effects, and alternative therapies, which enhances their engagement with care. However, individuals with low literacy may struggle to process complex health information, leading to misunderstanding of their diagnosis and treatment plans. To address this, comprehensive learning needs assessments should be embedded in patient care. These assessments must be

Table 2. Health Literacy, Learning Need Assessment Importance, Satisfaction with Education Activities (mean, SD)

Category	Variables	Mean	SD	
Health Literacy	Reading	4.29	0.78	
	Access	4.33	0.72	
	Understanding	4.43	0.61	
	Appraisal	4	0.84	
	Total Score	4.36	0.56	
Total Learning Need Assessment (Importance)	Diagnosis	4.38	0.72	
	Tests and Investigations	4.54	0.82	
	Surgery	4.57	0.82	
	Radiation Therapy	4.56	0.85	
	Chemotherapy/Hormonal Therapy	4.65	0.74	
	Clinical Trials	4.15	1.06	
	The sexual aspect of Care	4.34	0.81	
	Psychosocial aspect of care	4.54	0.71	
	Supportive Care	4.57	0.66	
	Overall Experience	4.64	0.56	
	Total Score	4.53	0.6	
	Satisfaction with education activities	Diagnosis	4.31	0.82
		Tests and Investigations	4.4	0.83
Surgery		4.39	0.83	
Radiation Therapy		4.25	0.9	
Chemotherapy/Hormonal Therapy		4.19	0.94	
Clinical Trials		3.9	1.01	
The sexual aspect of Care		3.96	1.03	
Psychosocial aspect of care		4.16	0.96	
Supportive Care		4.18	0.9	
Overall Experience		4.38	0.77	
Total Score		4.25	0.7	

Table 3. Gaps in Learning Among Patients (Importance-Satisfaction)

Variables	Gaps (Importance-Satisfaction)
Diagnosis	0.07
Tests and Investigations	0.14
Surgery	0.18
Radiation Therapy	0.31
Chemotherapy/Hormonal Therapy	0.46
Clinical Trials	0.25
The sexual aspect of Care	0.38
Psychosocial aspect of care	0.38
Supportive Care	0.39
Overall Experience	0.26
Total Score	0.28

designed to accommodate varying literacy levels to ensure equitable access to health information [4, 11]. Tailoring education to patient needs ensures that even those with low literacy can participate meaningfully in their care and make informed decisions.

Patient satisfaction with educational support correlates closely with their health literacy levels. Individuals with higher literacy are better positioned to comprehend medical terminology and treatment protocols, resulting in a smoother care journey [5, 13]. Patients who feel well-informed are more likely to report higher satisfaction, as they experience fewer uncertainties and feel more in control of their healthcare journey. Effective communication strategies are essential for meeting the educational needs of all patients, regardless of their literacy level. This includes the use of plain language, visual aids, and teach-back techniques to ensure patients fully understand the information provided [6, 10]. In cancer care, where treatment options can be overwhelming, clear communication helps patients feel involved in decision-making and ensures they remain engaged throughout their treatment.

A patient-centered approach to cancer care emphasizes the importance of understanding and addressing individual learning needs. Tailoring education to meet these needs ensures that patients are better equipped to evaluate the risks and benefits of different treatments and understand potential side effects [7, 9]. This approach is particularly important in oncology, where decisions are often complex and time-sensitive. In Oman, incorporating individualized learning assessments into cancer care pathways can improve patient engagement, reduce anxiety, and enhance treatment adherence. When patients have a clear

understanding of their condition, they are more likely to feel empowered and less overwhelmed by the healthcare process, resulting in improved outcomes [8, 9].

Personalized education fosters a trusting relationship between healthcare providers and patients. When educational materials are tailored to the unique needs of each patient, individuals feel understood and valued, which strengthens communication and trust. This sense of trust is essential for patient satisfaction and adherence to treatment plans [5]. Emotional and psychological burdens are common among cancer patients, and providing tailored education can help alleviate these concerns. Educating patients about their condition and available resources gives them a sense of control and promotes resilience throughout their treatment journey [14]. In Oman, refining educational strategies to better align with patient expectations is essential for delivering high-quality, patient-centered care [12].

Healthcare providers play a crucial role in enhancing health literacy by ensuring that patients receive information in ways that are accessible and easy to understand. Providers need to be trained in effective communication strategies, particularly when interacting with patients who have low health literacy [8]. Using plain language, visual materials, and techniques like teach-back ensures patients understand complex medical information and can retain critical knowledge. This approach is especially valuable in oncology, where misunderstandings can lead to non-adherence and treatment delays. In Oman, where diverse patient populations exist, healthcare providers must also be culturally sensitive in their communication. Tailoring health education to align with local cultural norms and values can significantly enhance patient engagement and satisfaction [9].

Digital tools are increasingly integrated into healthcare systems, offering new opportunities for patient education and engagement. However, for these tools to be effective, patients must possess the digital literacy skills needed to navigate them. Virtual support groups, patient portals, and mobile apps provide patients with access to valuable resources, including educational content and peer support networks [2]. In Oman, integrating digital literacy into health literacy initiatives ensures that all patients, regardless of their familiarity with technology, can benefit from these innovations. Digital platforms also enhance communication between patients and providers, allowing for timely updates and more personalized care [5, 7]. With the country's focus on healthcare modernization, leveraging these tools can significantly improve cancer care delivery and patient outcomes [15-17].

Educating patients about the emotional and

Table 4. Correlation between Study Variables

	Health Literacy Total Score	Learning Need Assessment (Importance)	Satisfaction with Education Activities
Literacy Total Score	1		
Learning Need Assessment (Importance) (r, p-value)	0.341 (0.022)	1	
Satisfaction with Education Activities	0.58 (<0.00001)	0.597 (<0.00001)	1

psychological impact of cancer is essential for their well-being. Psychosocial support, including counseling and mental health services, plays a vital role in helping patients cope with the challenges of diagnosis and treatment. In Oman, raising awareness about these services through patient education can enhance the overall care experience, ensuring patients feel supported both physically and emotionally [7, 9]. Integrating psychosocial education into cancer care not only improves emotional well-being but also aligns with global quality care standards [18].

Oman's healthcare system has made considerable progress in advancing cancer care by emphasizing patient education and empowerment. The country's Health Vision 2050 outlines strategic goals for improving public awareness about cancer prevention, early detection, and treatment options [6]. Aligning patient education initiatives with this national vision is crucial for ensuring that healthcare providers meet the evolving needs of patients and deliver care that meets global standards [9, 14]. Collaborative efforts among healthcare providers, policymakers, and non-governmental organizations are essential for achieving these goals.

Health literacy is foundational to patient-centered care, ensuring that patients can actively participate in decision-making and adhere to treatment plans. By addressing the specific learning needs of cancer patients, healthcare providers can reduce disparities in care and improve overall outcomes [8, 12]. In Oman, targeted educational interventions that account for both literacy levels and cultural contexts are essential for closing gaps in care and ensuring that all patients receive the information they need to manage their health effectively [5, 11]. Identifying and addressing gaps between patient expectations and educational support is crucial for enhancing care satisfaction and preventing disengagement from treatment [13]. Training healthcare providers to employ clear communication techniques and incorporate digital tools into patient education will further enhance care quality and ensure patients remain engaged throughout their treatment [19, 20].

Through continuous evaluation and monitoring, healthcare providers can refine educational programs to align with patient needs and improve outcomes. Key performance indicators (KPIs) are essential for assessing the effectiveness of these programs and ensuring they meet evolving healthcare goals [21]. The integration of virtual consultations and collaborative tools also promotes seamless communication among providers, improving coordination and continuity of care [15, 16]. Ultimately, by fostering patient empowerment through personalized education and culturally relevant communication strategies, Oman's healthcare system can bridge existing gaps in cancer care and align with global standards [21, 22].

In conclusion, Enhancing health literacy is critical for improving cancer care outcomes, especially in patient engagement, satisfaction, and adherence to and compliance with treatment plans. The study shows the need for tailored educational interventions that address

the identified learning needs of cancer patients in Oman. Healthcare providers can bridge the gaps in learning need assessment between patients' perceived importance of information and their satisfaction with the education they receive by focusing on culturally sensitive materials, clear communication, and e-literacy. Improving health literacy will elevate patient experiences and lead to better overall health outcomes in the Omani cancer care context.

Limitations

This study has several limitations that should be considered when interpreting the results. The cross-sectional design offers only a snapshot of health literacy and learning needs at one point in time, limiting the ability to observe changes or trends over time. A longitudinal design, following participants over a period, would provide deeper insights into how health literacy and learning needs evolve, as well as the impact of interventions on patient outcomes.

Additionally, the use of convenience sampling introduces potential selection bias, as participants with greater motivation or better access to healthcare services may be overrepresented. This may limit the generalizability of the findings to other cancer patients with different levels of access or socioeconomic backgrounds. Employing randomized sampling in future studies would help ensure more representative samples, capturing the diversity of patient experiences and needs.

The reliance on self-reported data also presents challenges, as participants may overestimate or underestimate their health literacy, experiences, or satisfaction levels due to response bias. Objective measures, such as validated tools or direct observation, could improve the accuracy of future studies. Furthermore, conducting the study in a single cancer center restricts the applicability of the findings to other regions in Oman. Multi-center studies would provide a more comprehensive understanding of health literacy and learning needs across diverse settings, ultimately helping to develop more targeted interventions and improve patient outcomes at a national level.

Future Directions in Health Literacy Research

The findings of this study identify the need for further research on patient education and health literacy in Oman. Future studies should explore the effectiveness of educational interventions and assess the improvements in health literacy and how it can impact long-term health outcomes. Additionally, research on e-health literacy and integrating technology into patient education programs could provide insights about improving cancer care in a digital world.

Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this study. All authors have independently contributed to the design, data collection, analysis, and interpretation of the findings without undue influence from external sources or organizations.

Ethical Guidelines

This study was conducted by the ethical standards of the Declaration of Helsinki and approved by the Institutional Review Board (IRB) at Sultan Qaboos Comprehensive Cancer Center (SQCCRC). All participants provided informed consent before being included in the study, and their privacy and confidentiality were strictly maintained. The information provided to participants clearly outlined the purpose of the study, eligibility criteria, and any potential risks or benefits. Participation was voluntary, and participants could withdraw from the study at any time without consequences.

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References

- Weller D. Health literacy and its impact on cancer outcomes. *European Journal of Cancer Care*. 2019 01;28(1):e12998. <https://doi.org/10.1111/ecc.12998>
- Housten AJ, Gunn CM, Paasche-Orlow MK, Basen-Engquist KM. Health Literacy Interventions in Cancer: a Systematic Review. *Journal of Cancer Education: The Official Journal of the American Association for Cancer Education*. 2021 04;36(2):240-252. <https://doi.org/10.1007/s13187-020-01915-x>
- Snowden A, Young J, White C, Murray E, Richard C, Lussier M, MacArthur E, Storey D, et al. Evaluating holistic needs assessment in outpatient cancer care—a randomised controlled trial: the study protocol. *BMJ open*. 2015 05 11;5(5):e006840. <https://doi.org/10.1136/bmjopen-2014-006840>
- Christiansen K, Buswell L, Fadelu T. A Systematic Review of Patient Education Strategies for Oncology Patients in Low- and Middle-Income Countries. *The Oncologist*. 2023 01 18;28(1):2-11. <https://doi.org/10.1093/oncolo/oyac206>
- Wen K, Gustafson DH. Needs assessment for cancer patients and their families. *Health and Quality of Life Outcomes*. 2004 02 26;2:11. <https://doi.org/10.1186/1477-7525-2-11>
- Galadari A, Alnaqbi J, Mansoori M, Darwish E, Khan F. Determinants of understanding and satisfaction with health education by patients in primary healthcare. *Ibnosina Journal of Medicine and Biomedical Sciences*. 2019 01 01;11:82. https://doi.org/10.4103/ijmbs.ijmbs_28_19
- Dijk SW, Duijzer EJ, Wienold M. Role of active patient involvement in undergraduate medical education: a systematic review. *BMJ open*. 2020 07 27;10(7):e037217. <https://doi.org/10.1136/bmjopen-2020-037217>
- Larson E, Sharma J, Bohren MA, Tunçalp Ö. When the patient is the expert: measuring patient experience and satisfaction with care. *Bulletin of the World Health Organization*. 2019 08 01;97(8):563-569. <https://doi.org/10.2471/BLT.18.225201>
- Mehdi I, Al Farsi AA, Al Bahrani B, Al-Raisi SS. General oncology care in Oman. *Cancer in the Arab World*. 2022;:175-93.
- Oman D. (Ed.). *Why religion and spirituality matter for public health: Evidence, implications, and resources*. Springer. 2018;2.
- Ammouri AA, Raddaha AA, Dsouza P, Geethakrishnan R, Noronha JA, Obeidat AA, Shakman L. Evidence-Based Practice: Knowledge, attitudes, practice and perceived barriers among nurses in Oman. *Sultan Qaboos University Medical Journal*. 2014 Nov;14(4):e537-545.
- Al-Noumani H, Al Omari O, Al-Naamani Z. Role of Health Literacy, Social Support, Patient-Physician Relationship, and Health-Related Quality of Life in Predicting Medication Adherence in Cardiovascular Diseases in Oman. *Patient Preference and Adherence*. 2023;17:643-652. <https://doi.org/10.2147/PPA.S401666>
- Tavousi M, Haeri-Mehrzi A, Rakhshani F, Rafiefar S, Soleymanian A, Sarbandi F, et al. Development and validation of a short and easy-to-use instrument for measuring health literacy: the Health Literacy Instrument for Adults (HELIA). *BMC public health*. 2020 05 12;20(1):656. <https://doi.org/10.1186/s12889-020-08787-2>
- Chua GP, Tan HK, Gandhi M. What information do cancer patients want and how well are their needs being met?. *Ecancermedicalscience*. 2018;12:873. <https://doi.org/10.3332/ecancer.2018.873>
- Al-Haijaa EA, Ayaad O, Al-Refaay M, Al-Refaay T. Malpractice: An Updated Concept Analysis and Nursing Implication in Developing Countries. *IOSR Journal of Nursing and Health Science*. 2018;7(1):81-5.
- Haroun A, Ayaad O, Al-Ruzzieh M, Ayyad M. The role of total quality management in improving patient experiences and outcomes. *British Journal of Healthcare Management*. 2022 Oct 02;28:1-8. <https://doi.org/10.12968/bjhc.2021.0082>
- Qaddumi B. The Relationship Between Factors, The Use Of Electronic Collaborative Tools, And Team Effectiveness. *International Journal of Art, Social, and Managerial Sciences*. 2024 08 23;1(1):32-39.
- Al-Ruzzieh MA, Ayaad O. Measuring Occupational Fatigue among Higher and Middle Management at a Specialized Cancer Center during the COVID-19 Pandemic. *Asian Pacific journal of cancer prevention: APJCP*. 2022 Oct 01;23(10):3265-3271. <https://doi.org/10.31557/APJCP.2022.23.10.3265>
- Al-Ruzzieh MA, Eddin R, Ayaad O, Kharabsheh M, Al-Abdallah D. Examining Nurse and Patient Factors Before and After Implementing an Oncology Acuity Tool: A Mixed Methods Study. *Journal of Nursing Measurement*. 2024 03 14;32(1):38-46. <https://doi.org/10.1891/JNM-2022-0001>
- Al-Ruzzieh MA, Ayaad O, Qaddumi B. The role of e-health in improving control and management of COVID 19 outbreak: current perspectives. *International Journal of Adolescent Medicine and Health*. 2020 08 31;34(4):139-145. <https://doi.org/10.1515/ijamh-2020-0072>
- Ayaad O. The Implications of Artificial Intelligence in the Quality of Health Services. *Innovative Multidisciplinary Journal for Science and Technology*. 2024 09 01;1(1):1-9. <https://doi.org/10.5281/zenodo.13387017>
- AL-Ruzzieh M, Rifai A, Ayaad O. Organisational citizenship behaviour in the healthcare workplace: a scoping review. *British Journal of Healthcare Management*. 2022 06 02;28:1-7. <https://doi.org/10.12968/bjhc.2021.0039>



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