



IMPROVING PATIENT OUTCOMES THROUGH HOLISTIC APPROACHES AND COLLABORATION BETWEEN DIFFERENT SPECIALTIES IN HOSPITAL SETTINGS

Eyad Jafar Ayash¹, Mohammed Ali Alasiri², Fahad Ali H Alfarhan³, Hamad Hamoud Rahil Alshammari⁴, Hana Hamoud Khalaf Alharfi⁵, Saad Ibrahim Alazmi⁶, Abdullah Thawab Fallaj Almutairi⁷, Duaa Abdullah Saleh Alsaeed⁸, Badria Abdulmajeed Dakhilallah Almalki⁹, Majed Bander Sunhat Alotaibi¹⁰, Shami Abdullah Hajaji¹¹, Faisal Abdulaziz A Alotaibi¹², Mohammed Abdullelah Alharbi¹³, Abdulkarim Awadh Mashan Alotaibi¹⁴

¹Physical Therapist, Ministry Of Interior, Facilities, Security Forces, Riyadh, Saudi Arabia

²Specialist-Laboratory, Ministry Of Interior, Facilities, Security Forces, Saudi Arabia

³Psychology Specialist, Nafi General Hospital

⁴Healthy Assistant, Maternity and Children's Hospital in Tabuk, Saudi Arabia

⁵Nursing technician, Al-Manshiya Health Center in Tabuk, Saudi Arabia

⁶Pharmacy Technician, Nafi General Hospital

⁷Emergency Medical Services, Afif Hospital - Im Arta Center, Afif, Saudi Arabia

⁸Pediatric registrar Al diriyah hospital

⁹Consultant medical microbiology, Alyamam general hospital

¹⁰Anesthesia Technology, Afif General Hospital, Afif, Saudi Arabia

¹¹Laboratory Technician, Regional Laboratory, Riyadh, Saudi Arabia

¹²Health Administration Specialist, Afif General Hospital, Afif, Saudi Arabia

¹³Laboratory Specialist, Tabuk Health Cluster, Tabuk, Saudi Arabia

¹⁴Social Specialist, Nafi General Hospital

Abstract:

Background: Holistic care, which considers patients as whole beings encompassing body, mind, and spirit, has gained recognition for its positive impact on patient well-being and outcomes. This approach emphasizes patient involvement, self-care, and collaboration among healthcare professionals to provide comprehensive care. Various healthcare specialists, including laboratory specialists, nurses, pediatricians, parasitologists, radiologists, physiotherapists, and nutritionists, play crucial roles in holistic care, contributing to improved patient outcomes and overall health. **Objective:** This review aims to assess the roles of different healthcare professionals in holistic care, identify barriers to effective collaboration, develop strategies to enhance communication among healthcare professionals, and evaluate the impact of holistic approaches on patient outcomes. Specifically, the objectives include evaluating the contributions of laboratory specialists, nurses, pediatricians, parasitologists, radiologists, physiotherapists, and nutritionists in holistic care, understanding challenges in collaboration, and assessing the outcomes of enhanced collaboration on patient care. **Conclusion:** Holistic care approaches, facilitated by a multidisciplinary team of healthcare professionals, have shown promising results in improving patient outcomes and overall well-being. By integrating various specialties and emphasizing a patient-centered approach, holistic care

enhances patient satisfaction, reduces treatment costs, and promotes better health outcomes. The collaborative efforts of laboratory specialists, nurses, pediatricians, parasitologists, radiologists, physiotherapists, and nutritionists contribute to a holistic approach that addresses the diverse needs of patients. Embracing holistic care empowers patients to take an active role in their healthcare, leading to improved adherence to treatment plans and holistic healing. Continued efforts to enhance communication and collaboration among healthcare professionals are essential for delivering personalized and effective care that benefits patients on multiple levels.

Keywords: holistic care, laboratory specialist, nutrition, pediatrician, paracitologist, physiotherapist, nurses, radiologist.

Introduction:

Providers of holistic care view patients as integrated beings encompassing body, mind, and spirit, emphasizing the importance of patient involvement in their own care journey. This approach fosters therapeutic consultation, instills hope, preserves dignity, promotes self-discipline, encourages social growth, nurtures autonomy, and enhances vigor and vitality [1].

Moreover, holistic care enhances healthcare providers' comprehension of patients and their requirements, advocating for patient education on self-care and independence in daily activities. The incorporation of palliative care within holistic practices further enhances patients' quality of life, addressing both emotional and physical well-being while promoting self-awareness and self-assurance [2].

In the realm of holistic medicine, the focus extends beyond treating disease to encompass health promotion and prevention, with an emphasis on education. Holistic practitioners view well-being as a spectrum ranging from clinical illness to complete physical, mental, and social well-being, striving towards the concept of "super health," characterized by exceptional vitality, joy, and creativity. This approach encourages individuals to maximize their biopsychosocial potential and manage clinical conditions [3].

Within holistic nursing, all facets of patients are considered, recognizing the impact of patients' thoughts, emotions, cultures, beliefs, and attitudes on their recovery, happiness, and satisfaction [4]. The foundation of holistic care lies in respecting human dignity, fostering relationships based on respect, openness, equality, and mutual participation in decision-making [5].

Laboratory specialists play a vital role in holistic care by delivering precise diagnostic data promptly, guiding treatment choices based on accurate analysis of blood, urine, and tissue samples [6]. Pediatricians specialize in providing tailored medical care for children and adolescents, collaborating with laboratory specialists to ensure optimal treatment outcomes [7].

Parasitologists specialize in the study of parasites and parasitic diseases, contributing to the diagnosis and treatment of infections impacting patients' health [8]. Physiotherapists focus on restoring and maintaining physical function and mobility, aiding patients in recovering from injuries or surgeries. Collaborating with parasitologists and physiotherapists enables comprehensive care addressing both the root causes of health issues and physical rehabilitation needs [9].

Nutritionists, experts in food science and nutrition, play a pivotal role in promoting healthy eating habits and addressing nutritional deficiencies affecting patients' health. Collaborating with nutritionists ensures personalized dietary recommendations that support overall health and well-being [10].

Objectives:

The main objectives of this review are:

1. To assess the of laboratory specialists, pediatricians, parasitologists, physiotherapists, nurses, radiologists, and nutritionists in patient holistic care.

2. To identify the barriers and challenges that hinder effective collaboration and holistic approaches in improving patient outcomes.
3. To develop and implement strategies to improve communication and collaboration between the different healthcare professionals involved in patient care.
4. To evaluate the impact of enhanced collaboration and holistic approaches on patient outcomes, including reduced hospital stays, improved recovery rates, and overall satisfaction with care.

The role of laboratory specialist in holistic care approaches:

Clinical laboratories are tasked with the essential role of generating consistent results that are applicable across different locations and time periods to improve patient care. This standardized approach in laboratory practice is crucial for enhancing healthcare outcomes both clinically, economically, and ethically. It facilitates the universal application of clinical research findings, regardless of where or when the studies were conducted. Laboratory specialists, through their expertise in conducting a variety of diagnostic tests on patient samples, such as blood, urine, and tissue samples, play a pivotal role in providing accurate diagnostic information that aids in the comprehensive evaluation and treatment of patients [11]. Their analysis and interpretation of test results contribute significantly to early disease detection, chronic condition monitoring, and treatment efficacy assessment [12]. Moreover, these professionals uphold patient safety standards by ensuring the precision and reliability of test results through rigorous adherence to quality control protocols and proficiency testing [13]. Collaborating closely with healthcare team members like physicians, nurses, and pharmacists, laboratory specialists contribute to delivering holistic and coordinated care to patients. Their meticulous attention to detail and specialized knowledge are vital in ensuring patients receive top-quality care and achieve optimal health outcomes. In summary, the indispensable role of laboratory specialists lies in their provision of valuable insights and support to the healthcare team, enabling the delivery of personalized, evidence-based care to patients within a holistic care framework [14].

The contribution of nurses in holistic care approaches:

Holistic nursing care (HNC) holds significant importance within the nursing practice, emphasizing comprehensive patient care. The primary objectives of holistic nursing encompass enhancing health, alleviating suffering, and averting illness. Moreover, holistic nurses are committed to safeguarding, promoting, and optimizing health and wellness, while also providing vital support to individuals in their pursuit of tranquility, comfort, and equilibrium during periods of illness [15]. The global demand for holistic nursing care continues to escalate, given the direct correlation between quality of life and holistic care. It is imperative that any conceptualization of quality of life be holistic, acknowledging the interconnectedness of various facets of an individual's life, as each aspect influences the others [16].

The implementation of holistic care has proven to be an effective strategy in preventing diseases and fatalities, as well as enhancing the quality of healthcare provision. This has led to a growing preference for holistic healthcare over conventional medicine worldwide, with one in every three individuals in the United States seeking holistic care [17]. The absence of holistic nursing care not only escalates treatment costs, prolongs hospital stays, and heightens the risk of developing new complications but also diminishes patient satisfaction by compromising the quality of care. Surprisingly, despite the benefits, holistic treatment is not widely practiced by nurses in many hospitals. Research indicates that a staggering 67% of patients in the United States do not receive holistic care, in stark contrast to the mere 5% of patients in Germany who do. The elimination of holistic care poses a profound crisis in the nursing profession, as it plays a pivotal role in health promotion and restoration [18].

Moreover, data reveals that nurses often lack experience in holistic care, neglect the holistic care model, fail to employ holistic techniques, and focus solely on patients' physical needs, treating them as mere biological entities, while disregarding their spiritual, mental, and social requirements [19]. A multitude of factors, such as insufficient time, experience, motivation, organizational challenges, and inadequate resources, can impede the practice of holistic care. Additionally, evidence suggests that a significant number of nurses do not practice holistic care due to their education in the biomedical allopathic system, which emphasizes disease over people, and a lack of comprehensive understanding of holistic nursing care [20].

The role of pediatrician in holistic care approaches:

Pediatricians are essential in delivering comprehensive care approaches for children, encompassing their physical, emotional, and mental health needs. Serving as the primary healthcare providers for children from infancy through adolescence, pediatricians have a multifaceted role that involves monitoring growth and development, diagnosing and treating illnesses, and advocating for healthy lifestyle choices [21]. Nonetheless, the scope of a pediatrician's responsibilities transcends mere physical health concerns. They also prioritize the psychological and social dimensions of a child's well-being, acknowledging the intricate interplay of these factors in overall health. Through embracing a holistic care philosophy, pediatricians gain deeper insights into and can effectively address the intricate needs of their young patients.

An integral component of the holistic care provided by pediatricians is preventive medicine [22]. By empowering parents and caregivers with knowledge about the significance of vaccinations, proper nutrition, and routine check-ups, pediatricians contribute to disease prevention and the promotion of long-term well-being. Moreover, they diligently strive to pinpoint and mitigate any underlying factors that may be contributing to a child's health challenges, such as environmental influences, family dynamics, or social determinants of health. Through a comprehensive care approach, pediatricians are better equipped to bolster the overall health and welfare of their patients.

Beyond physical health, pediatricians also prioritize the emotional and mental well-being of children [23]. Equipped with the expertise to identify indications of mental health conditions like anxiety, depression, or behavioral disorders, pediatricians can offer timely interventions or referrals to mental health specialists as needed. By addressing these concerns proactively, pediatricians can potentially avert the development of more severe mental health issues later in life. Through collaborative efforts with healthcare professionals, educators, policymakers, and community groups, pediatricians contribute to fostering a nurturing and supportive environment conducive to children's overall growth and flourishing [24].

The role of paracitologist in holistic care approaches:

Parasitologists are essential members of the healthcare team, bringing specialized knowledge and expertise in the study of parasites and their impact on human health [25]. They are trained to identify various types of parasites, understand their life cycles, and develop effective strategies for diagnosis, treatment, and prevention. By collaborating with healthcare professionals such as physicians, nurses, and laboratory specialists, parasitologists can provide valuable insights and recommendations to ensure comprehensive and integrated care for patients.

In a holistic care approach, the focus is on treating the whole person, considering not only the symptoms of a specific disease but also the physical, mental, emotional, and social aspects of a patient's well-being, as well as environmental and lifestyle factors [26]. Parasitologists play a crucial role in addressing these broader dimensions of health by identifying and addressing the root causes of parasitic infections, such as poor sanitation, contaminated water sources, or inadequate hygiene

practices. By adopting a holistic approach to care, healthcare providers can better understand and address the intricate interactions between parasites and their hosts, developing more effective and sustainable solutions for preventing and treating parasitic diseases.

Moreover, parasitologists contribute significantly to research and education, advancing our understanding of parasites and their impact on human health [27]. Through their research, they uncover new insights into the biology and behavior of parasites, identify emerging threats and trends in parasitic infections, and contribute to the development of innovative diagnostic tools, treatments, and prevention strategies. By sharing their knowledge and expertise through education and training programs, parasitologists help build capacity and strengthen healthcare systems to respond effectively to parasitic diseases and protect public health.

In addition to their clinical and research roles, parasitologists also play a vital role in public health efforts to control and prevent parasitic infections on a larger scale [28]. By monitoring and tracking the prevalence and distribution of parasites, conducting surveillance and outbreak investigations, and collaborating with government agencies and international organizations, parasitologists can identify and respond to emerging threats, implement effective control measures, and promote awareness and education about parasitic diseases. By working collaboratively with other stakeholders in the healthcare system, parasitologists can help shape policies and programs that address the root causes of parasitic infections and promote holistic approaches to care that prioritize the well-being of individuals and communities [29].

The role of radiologist in holistic care approaches:

Radiologists are indispensable in the realm of holistic care strategies as they furnish valuable diagnostic insights essential for guiding treatment decisions and enhancing overall patient well-being. These medical imaging specialists leverage a diverse array of imaging modalities, including X-rays, CT scans, MRIs, and ultrasounds, to visualize internal structures and pinpoint anomalies or illnesses [30]. Through their adept interpretation of these images, radiologists aid physicians in accurately diagnosing ailments, monitoring treatment progress, and making well-informed choices regarding patient care. Beyond their diagnostic duties, radiologists assume a pivotal role in patient management by collaborating with various healthcare professionals to formulate comprehensive treatment blueprints that cater to patients' physical, emotional, and psychological requirements. This collaborative, multidisciplinary approach guarantees that patients receive the most efficacious and personalized care conceivable [31].

Furthermore, radiologists contribute to holistic care paradigms by championing preventive healthcare measures and early disease detection through screening initiatives and imaging studies. By detecting potential health hazards and abnormalities in their nascent stages, radiologists empower patients to take proactive measures to bolster their health and avert the onset of severe conditions. Moreover, radiologists serve as educators for patients, elucidating imaging procedures, results, and treatment alternatives in a lucid and accessible manner [32]. This educational role empowers patients to make well-informed decisions about their healthcare and actively engage in their treatment strategies.

Additionally, radiologists stand at the vanguard of technological progressions in medical imaging, continuously exploring innovative avenues to enhance diagnostic precision, diminish radiation exposure, and amplify patient comfort. Through their dedication to remaining abreast of cutting-edge imaging technologies, radiologists ensure that patients receive the most advanced and efficacious diagnostic services possible. This unwavering commitment to delivering excellence in patient care underscores the pivotal role of radiologists in holistic care approaches, as they strive to provide top-tier, patient-centric care that addresses the physical, emotional, and social facets of health and well-being [33].

The role of physiotherapist in holistic care approaches:

Physiotherapists are integral components of holistic care approaches due to their expertise in evaluating and managing a diverse array of physical ailments that can impact an individual's overall well-being. Holistic care strategies concentrate on addressing the entirety of an individual rather than solely focusing on specific symptoms or illnesses [34]. Physiotherapists possess the capability to consider the physical, emotional, and social dimensions of an individual's health and collaborate with other healthcare professionals to devise comprehensive treatment strategies that encompass all these facets. Beyond administering hands-on therapies, physiotherapists also enlighten patients about their conditions and impart exercises and techniques to help them control their symptoms and avert potential issues [35]. This proactive approach to healthcare is in harmony with the holistic principle of addressing the underlying causes of problems rather than just the symptoms.

Moreover, physiotherapists frequently liaise with various healthcare professionals like physicians, nurses, and occupational therapists to ensure that patients receive all-encompassing care that caters to their complete requirements. This cooperative methodology is imperative for delivering holistic care as it permits the implementation of a more thorough and synchronized treatment regimen [36]. Furthermore, physiotherapists can contribute to enhancing overall well-being and preventing future health complications by offering education and advice on physical activity, body posture, and lifestyle adjustments. By attending to the physical, emotional, and social dimensions of an individual's health, physiotherapists aid in fostering a more holistic and patient-centric approach to healthcare. This, in turn, can result in enhanced outcomes, heightened patient contentment, and an improved quality of life for those under care [37].

The role of nutritionist in holistic care approaches:

In the realm of holistic care, nutritionists play a pivotal role in emphasizing the intricate relationship between food consumption and overall well-being. These highly trained professionals specialize in the comprehensive examination of food and its physiological impacts on the human body [38]. By collaborating closely with individuals, nutritionists evaluate their unique dietary requirements and craft customized nutrition strategies aimed at fostering optimal health and vitality. Within holistic care frameworks, nutritionists not only account for the physical aspects of nutrition but also consider the emotional, mental, and spiritual dimensions of an individual's well-being. Through an understanding of the interconnected nature of these diverse facets, nutritionists assist individuals in attaining a harmonious and enduring approach to their health journey.

An essential function of nutritionists within holistic care paradigms is to enlighten individuals on the significance of maintaining a wholesome diet and its profound implications on their overall welfare. Through collaborative efforts, nutritionists aid clients in pinpointing areas in their diet that necessitate enhancement and offer guidance on adopting healthier eating habits [39]. Furthermore, they may provide counsel on meal preparation, portion management, and mindful eating techniques to foster a positive relationship with food. By equipping individuals with the knowledge and skills to make informed dietary choices, nutritionists empower them to realize their health objectives and enhance their quality of life. Apart from dispensing dietary recommendations, nutritionists also play a crucial role in addressing specific health issues and conditions through nutrition therapy. They collaborate with individuals grappling with chronic ailments such as diabetes, cardiovascular diseases, or obesity to devise tailored nutrition regimens that complement their treatment and care strategies. Nutritionists also extend support to individuals contending with food allergies, intolerances, digestive disorders, or eating disorders by aiding them in navigating their dietary requirements and limitations. Through an encompassing approach to nutrition therapy, nutritionists delve into the root causes of health ailments, fostering healing from within [40].

By operating within multidisciplinary teams, nutritionists ensure that all facets of an individual's health are comprehensively evaluated and tended to in a cohesive manner. This collaborative model

facilitates an integrated and personalized approach to care, with each healthcare provider contributing their specialized knowledge to bolster the overall well-being of the individual [41].

Impact of holistic care approaches on patient health:

The holistic care approach, as defined in the literature [42], encompasses a comprehensive healthcare strategy that takes into account not only the physical aspects but also the emotional, social, and spiritual dimensions of an individual's well-being. This method places emphasis on the treatment of the entire individual rather than merely focusing on the symptoms associated with a particular illness or condition. By addressing the various facets of a patient's health, holistic care endeavors to enhance overall wellness and prevent potential health issues. Studies have indicated that individuals receiving holistic care exhibit enhanced health outcomes, such as decreased pain levels, improved mental well-being, and an elevated quality of life. Moreover, this approach encourages patients to play an active role in managing their healthcare, resulting in improved adherence to treatment plans and the adoption of healthier lifestyle choices. The profound impact of holistic care on patient health is evident in its ability to target the underlying causes of health concerns and facilitate healing on multiple levels. Healthcare professionals who adopt a holistic care approach are better equipped to deliver tailored and efficient care that genuinely benefits their patients [43].

Conclusion:

In conclusion, holistic care approaches play a vital role in improving patient outcomes by considering the physical, emotional, social, and spiritual aspects of an individual's well-being. By involving a multidisciplinary team of healthcare professionals, including laboratory specialists, nurses, pediatricians, parasitologists, radiologists, physiotherapists, and nutritionists, holistic care aims to provide comprehensive and integrated care that enhances patient satisfaction, reduces treatment costs, and improves overall health outcomes. Embracing a holistic care approach empowers patients to actively participate in their healthcare, leading to better adherence to treatment plans and promoting healing on multiple levels. The impact of holistic care on patient health is significant, as it addresses the root causes of health issues and promotes overall wellness. Healthcare providers should continue to collaborate and implement strategies to enhance communication and collaboration in order to deliver personalized and effective care that benefits patients on a holistic level.

References:

1. Thompson EA, Quinn Q, Paterson C, Cooke H, McQuigan D, Butters G. Outcome measures for holistic, complex interventions within the palliative care setting. *Complement Ther Clin Pract*. 2008;14:25–32. [PubMed] [Google Scholar]
2. Fahy K, Hastie C, Bisits A, Marsh C, Smith L, Saxton A. Holistic physiological care compared with active management of the third stage of labour for women at low risk of postpartum haemorrhage: A cohort study. *Women Birth*. 2010;23:146–52. [PubMed] [Google Scholar]
3. McEvoy L, Duffy A. Holistic practice – A concept analysis. *Nurse Educ Pract*. 2008;8:412–9. [PubMed] [Google Scholar]
4. Selimen D, Andsoy II. The importance of a holistic approach during the perioperative period. *AORN J*. 2011;93:482–90. [PubMed] [Google Scholar]
5. Davis-Floyd R. The technocratic, humanistic, and holistic paradigms of childbirth. *Int J Gynaecol Obstet*. 2001;75(Suppl 1):S5–23. [PubMed] [Google Scholar]
6. Raymond, Louis et al. “Advancing laboratory medicine in hospitals through health information exchange: a survey of specialist physicians in Canada.” *BMC medical informatics and decision making* vol. 20,1 44. 28 Feb. 2020, doi:10.1186/s12911-020-1061-z
7. Boudreau, Alexy et al. “Pediatric Primary Health Care: The Central Role of Pediatricians in Maintaining Children's Health in Evolving Health Care Models.” *Pediatrics* vol. 149,2 (2022): e2021055553. doi:10.1542/peds.2021-055553

8. Juarez-Estrada, Marco A et al. "Editorial: Parasitism: the good, the bad and the ugly." *Frontiers in veterinary science* vol. 10 1304206. 17 Oct. 2023, doi:10.3389/fvets.2023.1304206
9. Hartley, Sandra Elaine et al. "Future-proofing the Profession: Physiotherapists' perceptions of their current and emerging role." *Physiotherapy* vol. 119 (2023): 72-79. doi:10.1016/j.physio.2022.11.007
10. Erickson, Nicole et al. "Nutrition care is an integral part of patient-centred medical care: a European consensus." *Medical oncology (Northwood, London, England)* vol. 40,4 112. 7 Mar. 2023, doi:10.1007/s12032-023-01955-5
11. American Clinical Laboratory Association . Value of lab testing. 2019. [Google Scholar]
12. Silverstein MD. An approach to medical errors and patient safety in laboratory services a white paper prepared for the quality institute meeting making the laboratory a partner in patient safety. Atlanta: Division of Laboratory Systems Centers for Disease Control and Prevention; 2003. [Google Scholar]
13. Ngo A, Gandhi P, Miller WG. Frequency that laboratory tests influence medical decisions. *J Appl Lab Med*. 2017;1(4):410–414. doi: 10.1373/jalm.2016.021634. [PubMed] [CrossRef] [Google Scholar]
14. Walz SE, Darcy TP. Patient safety and post-analytical error. *Clin Lab Med*. 2013;33(1):183–194. doi: 10.1016/j.cll.2012.10.001. [PubMed] [CrossRef] [Google Scholar]
15. Ventegodt S, Kandel I, Ervin DA. J. M. Concepts of holistic care. *Health care for people with intellectual and developmental disabilities across the lifespan*. 2016:1935-41.
16. Ngugi GaI O. Understanding holistic nursing practice. *Arcada*. 2015:5281–2.
17. (WHO) WHO. WHO Global Report on Traditional and Complementary Medicine: World Health Organization. 2019.
18. Bahrami M. Do nurses provide holistic care to cancer patients? *Iran J Nurs Midwifery Res*. 2010;15(4):245. [PMC free article] [PubMed] [Google Scholar]
19. Vahid Zamanzadeh M, Jasemi L, Valizadeh B, Keogh Fariba Taleghani. Effective factors in providing holistic care: a qualitative study. *Indian J Palliat Care*. 2015;21(2):214–24. doi: 10.4103/0973-1075.156506. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
20. Albaqawi HM, Butcon VE, Albagawi BS, Dayrit RD, Petelyne Pangket Holistic nursing care among operating room nurses: strengthening the standard of practice in Saudi Arabia. *Belitung Nurs J*. 2021;7(1):8–14. doi: 10.33546/bnj.1279. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
21. Hagan JF, Shaw JS, Duncan PM, eds.. *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*, 4th ed. Itasca, IL: American Academy of Pediatrics; 2017 [Google Scholar]
22. Child and Adolescent Health Measurement Initiative, Data Resource Center on Child and Adolescent Health . *National Survey of Children's Health 2018*. Available at: <https://www.childhealthdata.org/learn-about-the-nsch/NSCH>. Accessed September 17, 2020
23. American Academy of Pediatrics, Committee on Pediatric Workforce . Definition of a pediatrician. *Pediatrics*. 2015;135(4):780–781 [Google Scholar]
24. Medical Home Initiatives for Children With Special Needs Project Advisory Committee. American Academy of Pediatrics . The medical home. *Pediatrics*. 2002;110(1 Pt 1):184–186 [PubMed] [Google Scholar]
25. Rózsa L, Garay J. Definitions of parasitism, considering its potentially opposing effects at different levels of hierarchical organization. *Parasitol*. (2023) 150:761–68. 10.1017/S0031182023000598 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
26. Santiago MFM, King KC, Drew GC. Interactions between insect vectors and plant pathogens span the parasitism–mutualism continuum. *Biol Lett*. (2023) 19:20220453. 10.1098/rsbl.2022.0453 [PMC free article] [PubMed] [CrossRef] [Google Scholar]

27. Lymbery AJ, Smit NJ. Conservation of parasites: a primer. *Int J Parasitol Parasites Wildl.* (2023) 21:255–63. 10.1016/j.ijppaw.2023.07.001 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
28. Hasik AZ, de Angeli Dutra D, Doherty JF, Duffy MA, Poulin, R, Siepielski AM. Resetting our expectations for parasites and their effects on species interactions: a meta-analysis. *Ecol Lett.* (2023) 26:184–99. 10.1111/ele.14139 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
29. López-García P, Moreira D. The symbiotic origin of the eukaryotic cell. *C R Biol.* (2023) 346:55–73. 10.5802/crbio.118 [PubMed] [CrossRef] [Google Scholar]
30. Brady AP. Radiology reporting—from Hemingway to HAL? *Insights Imaging.* 2018;9:237–246. doi: 10.1007/s13244-018-0596-. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
31. Brady A. The vanishing radiologist: an unseen danger, and a danger of being unseen. *Eur Radiol.* 2021;31:5998–6000. doi: 10.1007/s00330-021-07723-1. [PubMed] [CrossRef] [Google Scholar]
32. Glazer GM, Ruiz-Wibbelsmann JA. The invisible radiologist. *Radiology.* 2011;258(1):18–22. doi: 10.1148/radiol.10101447. [PubMed] [CrossRef] [Google Scholar]
33. Brady AP. Measuring consultant radiologist workload: method and results from a national survey. *Insights Imaging.* 2011;2:247–260. doi: 10.1007/s13244-011-0094-3. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
34. World Health Organization. The world health report 2002: reducing risks, promoting healthy life. World Health Organization; 2002. [Google Scholar]
35. Woolf AD, Akesson K. Understanding the burden of musculoskeletal conditions. The burden is huge and not reflected in national health priorities. *BMJ.* 2001;322(7294):1079–1080. doi: 10.1136/bmj.322.7294.1079 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
36. Dean E, Söderlund A. What is the role of lifestyle behaviour change associated with non-communicable disease risk in managing musculoskeletal health conditions with special reference to chronic pain? *BMC Musculoskelet Disord.* 2015;16(1):1–7. doi: 10.1186/s12891-015-0545-y [PMC free article] [PubMed] [CrossRef] [Google Scholar]
37. van Hecke O, Torrance N, Smith BH. Chronic pain epidemiology—where do lifestyle factors fit in? *Br J Pain.* 2013;7(4):209–217. doi: 10.1177/2049463713493264 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
38. Deftereos I, Kiss N, Brown T, Carey S, Carter VM, Usatoff V, et al. Awareness and perceptions of nutrition support in upper gastrointestinal cancer surgery: a national survey of multidisciplinary clinicians. *Clin Nutr ESPEN.* 2021;46:343–349. doi: 10.1016/j.clnesp.2021.09.734. [PubMed] [CrossRef] [Google Scholar]
39. Sullivan ES, Rice N, Kingston E, Kelly A, Reynolds JV, Feighan J, et al. A national survey of oncology survivors examining nutrition attitudes, problems and behaviours, and access to dietetic care throughout the cancer journey. *Clin Nutr ESPEN.* 2021;41:331–339. doi: 10.1016/j.clnesp.2020.10.023. [PubMed] [CrossRef] [Google Scholar]
40. Caccialanza R, Goldwasser F, Marschal O, Ottery F, Schiefke I, Tilleul P, et al. Unmet needs in clinical nutrition in oncology: a multinational analysis of real-world evidence. *Ther Adv Med Oncol.* 2020;1(12):1758835919899852. [PMC free article] [PubMed] [Google Scholar]
41. Kok A, van der Lugt C, Leermakers-Vermeer MJ, de Roos NM, Speksnijder CM, de Bree R. Nutritional interventions in patients with head and neck cancer undergoing chemoradiotherapy: current practice at the dutch head and neck oncology centers. *Clin Nutr ESPEN.* 2020;1(40):545. [PMC free article] [PubMed] [Google Scholar]
42. Jasemi, Madineh et al. “A Concept Analysis of Holistic Care by Hybrid Model.” *Indian journal of palliative care* vol. 23,1 (2017): 71-80. doi:10.4103/0973-1075.197960
43. Ambushe, Selamawit Ataro et al. “Holistic nursing care practice and associated factors among nurses in public hospitals of Wolaita zone, South Ethiopia.” *BMC nursing* vol. 22,1 390. 18 Oct. 2023, doi:10.1186/s12912-023-01517-0

