SELECTED ABSTRACTS FROM PUBMED

1.

ABSTRACT

Maintaining data quality is a fundamental requirement for any successful and long-term data management. Providing high-quality, reliable, and statistically sound data is a primary goal for clinical research informatics. In addition, effective data governance and management are essential to ensuring accurate data counts, reports, and validation. As a crucial step of the clinical research process, it is important to establish and maintain organization-wide standards for data quality management to ensure consistency across all systems designed primarily for cohort identification, allowing users to perform an enterprise-wide search on a clinical research data repository to determine the existence of a set of patients meeting certain inclusion or exclusion criteria. Some of the clinical research tools are referred to as de-identified data tools. Assessing and improving the quality of data used by clinical research informatics tools are both important and difficult tasks. For an increasing number of users who rely on information as one of their most important assets, enforcing high data quality levels represents a strategic investment to preserve the value of the data. In clinical research informatics, better data quality translates into better research results and better patient care. However, achieving high-quality data standards is a major task because of the variety of ways that errors might be introduced in a system and the difficulty of correcting them systematically. Problems with data quality tend to fall into two categories. The first category is related to inconsistency among data resources such as format, syntax, and semantic inconsistencies. The second category is related to poor ETL and data mapping processes. In this paper, we describe a real-life case study on assessing and improving the data quality at one of healthcare organizations. This paper compares between the results obtained from two de-identified data systems i2b2, and Epic Slicedicer, and discuss the data quality dimensions' specific to the clinical research informatics context, and the possible data quality issues between the de-identified systems. This work in paper aims to propose steps/rules for maintaining the data quality among different systems to help data managers, information systems teams, and informaticists at any health care organization to monitor and sustain data quality as part of their business intelligence, data governance, and data democratization processes.

Keywords: clinical research data; data quality; informatics; management of clinical data; research informatics.

2.

ABSTRACT

Although many medical and dental journals publish qualitative research this does not mean they are being read by those who could directly benefit from their scholarly contributions. From clinician to the patient. This perspective on qualitative research for medical and dental education was written with the intention of introducing qualitative research to those who may be unaware of its possibilities and utility for clinical education. Its task is to inform others about life conditions they may not have experienced themselves other than in a biomedical context. As researchers, clinicians, and especially for students who read academic, medical, and clinical research papers which are appropriately discipline- and methodology-specific. We may find ourselves encultured to privileging one type of research methodology over others. For example, exclusively considering quantitative research methodologies as being more rigorous and trustworthy. This brief commentary may offer the opportunity for interested healthcare providers and researchers to expand their understanding of the purpose of qualitative research, its role and application in enhancing patient engagement, clinical practices, and person-centered research.

Keywords: clinical engagement; hermeneutics; medical education; qualitative research.

3.

ABSTRACT

The coronavirus disease-19 (COVID-19) pandemic promises to have lasting impacts on cancer clinical trials that could lead to faster patient access to new treatments. In this article, an international panel of oncology experts discusses the lasting impacts of the pandemic on oncology clinical trials and proposes solutions for clinical trial stakeholders, with the support of recent data on worldwide clinical trials collected by IQVIA. These lasting impacts and proposed solutions encompass three topic areas. Firstly, acceleration and implementation of new operational approaches to oncology trials with patient-centric, fully decentralized virtual approaches that include remote assessments via telemedicine and remote devices. Geographical differences in the uptake of remote technology, including telemedicine, are discussed in the article, focusing on the impact of the local adoption of new operational approaches. Secondly, innovative clinical trials. The pandemic has highlighted the need for new trial designs that accelerate research and limit risks and burden for patients while driving optimization of clinical trial objectives and endpoints, while testing is being minimized. Areas of considerations for clinical trial stakeholders are discussed in detail. In addition, the COVID-19 pandemic has exposed the underrepresentation

of minority groups in clinical trials; the approach for oncology clinical trials to improve generalizability of efficacy and outcomes data is discussed. Thirdly, a new problem-focused collaborative framework between oncology trial stakeholders, including decision makers, to leverage and further accelerate the innovative approaches in clinical research developed during the COVID-19 pandemic. This could shorten timelines for patient access to new treatments by addressing the cultural and technological barriers to adopting new operational approaches and innovative clinical trials. The role of the different stakeholders is described, with the aim of making COVID-19 a catalyst for positive change in oncology clinical research and eventually in cancer care.

Keywords: COVID-19; cancer care; clinical research; collaborative framework; real-world evidence.

4. ***Shao D, Dai Y, Li N, Cao X, Zhao W, Cheng L, et al. Artificial intelligence in clinical research of cancers. Brief Bioinform. 2022 Jan 17;23(1):bbab523. doi: 10.1093/bib/bbab523.***

ABSTRACT

Several factors, including advances in computational algorithms, the availability of high-performance computing hardware, and the assembly of large community-based databases, have led to the extensive application of Artificial Intelligence (AI) in the biomedical domain for nearly 20 years. AI algorithms have attained expert-level performance in cancer research. However, only a few AI-based applications have been approved for use in the real world. Whether AI will eventually be capable of replacing medical experts has been a hot topic. In this article, we first summarize the cancer research status using AI in the past two decades, including the consensus on the procedure of AI based on an ideal paradigm and current efforts of the expertise and domain knowledge. Next, the available data of AI process in the biomedical domain are surveyed. Then, we review the methods and applications of AI in cancer clinical research categorized by the data types including radiographic imaging, cancer genome, medical records, drug information and biomedical literatures. At last, we discuss challenges in moving AI from theoretical research to real-world cancer research applications and the perspectives toward the future realization of AI participating cancer treatment.

Keywords: artificial intelligence; clinical research of cancers; deep learning; drug discovery.

5. ***Ochieng J, Kwagala B, Sewankambo N. Collection and use of human materials during TB clinical research; a review of practices. BMC Med Ethics. 2022 Mar 29;23(1):36. doi: 10.1186/s12910-022-00776-x.***

ABSTRACT

Background: Human biological materials are usually stored for possible future use in research because they preserve valuable biological information, save time and resources, which would have been spent on collection of fresh samples. However, use of these materials may pose ethical challenges such as unauthorized disclosure of genetic information, which can result in dire consequences for individuals or communities including discrimination, stigma, and psychological harm; has biosecurity implications; and loss of control or ownership of samples or data. To understand these problems better, we evaluated the extent to which tuberculosis (TB) clinical research protocols that were used to collect and store biological materials for future use conform to the requirements stated in the Uganda national guidelines for research involving humans as participants.

Methods: This was a retrospective review of TB clinical research projects approved by the Uganda National Council for Science and Technology (UNCST) from 2011 to 2015, to examine whether they fulfilled the requirements for ethical collection and use of human materials. Data were abstracted through review of the project protocols using a template developed based on the informed consent and the Materials Transfer Agreement (MTA) requirements in the national guidelines.

Results: Out of 55 research protocols reviewed, most of the protocols 83.6% had been used to collect the stored samples (sputum, blood and sometimes urine), 28% had a section on specimen collection and 24% mentioned ownership of the biological materials. With respect to review of the consent forms used in the studies that stored materials for future use, only 9% of the protocols had a separate consent form for storage of materials, 4.5% of the consent forms explained the risks, 11.4% explained the purpose of the study while 6.8% mentioned the place of storage for the collected materials.

Conclusion: Many of the studies reviewed did not meet the requirements for collection and storage of biological materials contained in the national guidelines, which indicates a need to additional training on this topic.

Keywords: Collection; Human biological materials; Storage; TB clinical research; Use.

6. ***Rasmussen CM, McMillan KB, McMillan DC, Assael LA, Arce K. Education Solutions to the Medical-Dental Divide. AMA J Ethics. 2022 Jan 1;24(1):E27-32. doi: 10.1001/amajethics.2022.27.***

ABSTRACT

Arbitrarily cordoning off the mouth from the rest of the body is the educational approach that, since 1840, has been responsible for the medical-dental schism that persists today, preventing oral health's integration with overall health. This divide has also thwarted oral disease prevention initiatives, access to services, and health equity. This article offers an educational plan for reunifying medicine and dentistry, which involves interprofessional education, dual degree training, integrating oral health into medical education, and integrated residency training.

7. Hao X, Peng X, Ding X, Qin Y, Lv M, Li J, et al. Application of digital education in undergraduate nursing and medical interns during the COVID-19 pandemic: A systematic review. Nurse Educ Today. 2022 Jan;108:105183. doi: 10.1016/j.nedt.2021.105183. Epub 2021 Oct 25.

ABSTRACT

Background: Due to the rapid spread of coronavirus disease 2019 (COVID-19) around the world, the World Health Organization (WHO) declared it a global pandemic on March 11, 2020. This declaration had an unprecedented impact on health profession education, especially the clinical clerkship of nursing and medical students. The teaching hospitals had to suspend traditional bedside clinical teaching and switch to digital education.

Objective: To systematically synthesize the available literature on the application of digital education in undergraduate nursing and medical interns during the COVID-19 pandemic.

Design: A systematic review informed by PRISMA guidelines.

Data sources: Five electronic databases were systematically searched: PubMed, Embase, MEDLINE (OVID), CINAHL and the Cochrane Library.

Review methods: The retrieved articles were screened at the title, abstract, and full text stages. The Mixed-Methods Appraisal Tool (MMAT) was used to assess the quality of quantitative and mixed-method studies. Then, two reviewers extracted the quantitative data of the included studies.

Results: A total of 4596 studies were identified following a comprehensive search, and 16 studies were included after removing duplicates and screening, which focused on undergraduate nursing students (3 studies) and medical students (13 studies). We found that the standalone digital education modalities were as effective as conventional learning for knowledge and practice. Different educational technologies have different effects on the knowledge and practice of interns.

Conclusion: Digital education plays a significant role in distance training for nursing and medical interns both now and in the future. The overall risk of bias was high, and the quality of evidence was found to be variable. There is a need for further research designing more quasi-experimental studies to assess the effectiveness of standalone digital education interventions for the remote training of nursing or medical interns to be fully prepared for emergencies.

Keywords: COVID-19; Clinical practicum; Digital education; Medical students; Nursing students; Undergraduate.

8. Eduardo Herrera-Aliaga E, Estrada LD. Trends and Innovations of Simulation for Twenty First Century Medical Education. Front Public Health. 2022 Mar 3;10:619769. doi: 10.3389/fpubh.2022.619769. eCollection 2022.

ABSTRACT

In the last two decades there has been an enormous growth in the use of clinical simulation. This teaching-learning methodology is currently the main tool used in the training of healthcare professionals. Clinical simulation is in tune with new paradigms in education and is consistent with educational theories that support the use of experiential learning. It promotes the development of psychomotor skills and strengthens executive functions. This pedagogical approach can be applied in many healthcare topics and is particularly relevant in the context of restricted access to clinical settings. This is particularly relevant considering the current crisis caused by the COVID-19 pandemic, or when trying to reduce the frequency of accidents attributed to errors in clinical practice. This mini-review provides an overview of the current literature on healthcare simulation methods, as well as prospects for education and public health benefits. A literature search was conducted in order to find the most current trends and state of the art in medical education simulation. Presently, there are many areas of application for this methodology and new areas are constantly being explored. It is concluded that medical education simulation has a solid theoretical basis and wide application in the training of health professionals at present. In addition, it is consolidated as an unavoidable methodology both in undergraduate curricula and in continuing medical education. A promising scenario for medical education simulation is envisaged in the future, hand in hand with the development of technological advances.

Keywords: COVID-19; competences; healthcare; medical education; public health; simulation.

9. Trullàs JC, Blay C, Sarri E, Pujol R. Effectiveness of problem-based learning methodology in undergraduate medical education: a scoping review. BMC Med Educ. 2022 Feb 17;22(1):104. doi: 10.1186/s12909-022-03154-8.

ABSTRACT

Background: Problem-based learning (PBL) is a pedagogical approach that shifts the role of the teacher to the student (student-centered) and is based on self-directed learning. Although PBL has been adopted in undergraduate and postgraduate medical education, the effectiveness of the method is still under discussion. The author's purpose was to appraise available international evidence concerning to the effectiveness and usefulness of PBL methodology in undergraduate medical teaching programs.

Methods: The authors applied the Arksey and O'Malley framework to undertake a scoping review. The search was carried out in February 2021 in PubMed and Web of Science including all publications in English and Spanish with no limits on publication date, study design or country of origin.

Results: The literature search identified one hundred and twenty-four publications eligible for this review. Despite the fact that this review included many studies, their design was heterogeneous and only a few provided a high scientific evidence methodology (randomized design and/or systematic reviews with meta-analysis). Furthermore, most were single-center experiences with small sample size and there were no large multi-center studies. PBL methodology obtained a high level of satisfaction, especially among students. It was more effective than other more traditional (or lecture-based methods) at improving social and communication skills, problem-solving and self-learning skills. Knowledge retention and academic performance weren't worse (and in many studies were better) than with traditional methods. PBL was not universally widespread, probably because requires greater human resources and continuous training for its implementation.

Conclusion: PBL is an effective and satisfactory methodology for medical education. It is likely that through PBL medical students will not only acquire knowledge but also other competencies that are needed in medical professionalism.

Keywords: Education; Medicine; Problem-based learning; Systematic review.

10. *Merlo AC, Bona RD, Ameri P, Porto I. Type 2 myocardial infarction: a diagnostic and therapeutic challenge in contemporary cardiology. Intern Emerg Med. 2022 Mar;17(2):317-324. doi: 10.1007/s11739-021-02920-8. Epub 2022 Feb 14.*

ABSTRACT

In the expanding world of cardiovascular diseases, rapidly reaching pandemic proportions, the main focus is still on coronary atherosclerosis and its clinical consequences. However, at least in the Western world, middle-aged male patients with acute myocardial infarction are no more the rule. Due to a higher life expectancy and major medical advances, physicians are to treat older and frailer individuals, usually with multiple comorbidities. In this context, myocardial ischaemia and infarction frequently result from an imbalance between myocardial oxygen supply and demand-i.e., type 2 myocardial infarction (T2MI), according to the current universal definition-rather than coronary atherothrombosis. Moreover, the increasing use of high-sensitivity cardiac troponin assays has led to a heightened detection of T2MI-often causing relatively little myocardial injury-, which seems to have doubled its numbers in recent years. Nevertheless, owing to its multifaceted pathophysiology and clinical presentation, T2MI is still underdiagnosed. Perhaps more importantly, T2MI is also victim of undertreatment, as drugs that constitute the cornerstone of therapy in most cardiovascular diseases are much more unlikely to be prescribed in T2MI than in coronary atherothrombosis. In this paper, we review the recent literature on the classification, pathophysiology, epidemiology, and management of T2MI, trying to summarise the state-of-the-art knowledge about this increasingly important pathologic condition. Finally, based on the current scientific evidence, we also propose an algorithm that may be easily utilised in clinical practice, in order to improve T2MI diagnosis and risk stratification.

Keywords: Cardiac troponin; Coronary angiography; Myocardial infarction; Myocardial injury.

11. *McMahon CJ, Tretter JT, Redington AN, Bu'Lock F, Zühlke L, Heying R, et al. Medical education and training within congenital cardiology: current global status and future directions in a post COVID-19 world. Cardiol Young. 2022 Feb;32(2):185-197. doi: 10.1017/S1047951121001645. Epub 2021 Apr 12.*

ABSTRACT

Despite enormous strides in our field with respect to patient care, there has been surprisingly limited dialogue on how to train and educate the next generation of congenital cardiologists. This paper reviews the current status of training and evolving developments in medical education pertinent to congenital cardiology. The adoption of competency-based medical education has been lauded as a robust framework for contemporary medical education over the last two decades. However, inconsistencies in frameworks across different jurisdictions remain, and bridging gaps between competency frameworks and clinical practice has proved challenging. Entrustable professional activities have been proposed as a solution, but integration of such activities into busy clinical cardiology practices will present its own challenges. Consequently, this pivot towards a more structured approach to medical education necessitates the widespread availability of appropriately trained medical educationalists, a development that will better inform curriculum development, instructional design, and assessment. Differentiation between superficial and deep learning, the vital role of rich formative feedback and coaching, should guide our trainees to become self-regulated learners, capable of critical reasoning yet retaining an awareness of uncertainty and ambiguity. Furthermore, disruptive innovations such as "technology enhanced learning" may be leveraged to improve education, especially for trainees from low- and middle-income countries. Each of these initiatives will require resources, widespread advocacy and raised awareness, and publication of supporting data, and so it is especially gratifying that Cardiology in the Young has fostered a progressive approach, agreeing to publish one or two articles in each journal issue in this domain.

Keywords: Adult congenital heart disease; congenital cardiology; congenital heart disease; education; paediatric cardiology; training.