

SELECTED ABSTRACTS FROM PUBMED

1. *Althubaiti A, Althubaiti SM. Medical research: what to expect in a student-supervisor relationship. BMC Med Educ. 2022 Nov 10;22(1):774. doi: 10.1186/s12909-022-03851-4.*

ABSTRACT

Background: A medical research supervisor is of crucial importance to the undergraduate student enrolled in a research methodology course. A solid relationship between the two is vital to the success of the research project and the overall well-being of the student. The structure of the relationship between a student and a research supervisor is seldom discussed in the context of undergraduate medical research. This study evaluates students' expectations of their research contributions and their supervisors' roles.

Methods: This was an observational study in a large health university in Saudi Arabia. A total of 320 medical students enrolled in a two-year medical research program completed an online survey, of a previously validated instrument, that is, Role Perceptions Rating Scale. Demographic questions such as the current level in the research program (junior or senior) were added.

Results: The results showed that most students expected the responsibility to be equally shared between the supervisor and student during the development and execution of the research project. Additionally, students expected the research supervisor to be responsible for the research themes and contents, ensuring access to facilities, and assisting in the actual writing of the final research manuscript. Furthermore, the results indicated differences in expectations between junior and senior students.

Conclusion: This study demonstrates that medical students expect their research supervisors to support them to a significant extent. Understanding medical students' expectations in a supervisor-student relationship is essential to successful research and collaboration. The evidence gathered in this study has practical implications for educational institutes to base their research training program on these insights. Providing clarity on the expectations and responsibilities of those participating in the research program is crucial, as this would, in turn likely advance the output of the research program and encourage clinicians to join the program as research supervisors.

Keywords: Expectation; Medical Research; Relationship; Research Supervisor; Role Perception; Students.

2. *Dwivedi AK. How to write statistical analysis section in medical research. J Investig Med. 2022 Dec;70(8):1759-1770. doi: 10.1136/jim-2022-002479. Epub 2022 Jun 16.*

ABSTRACT

Reporting of statistical analysis is essential in any clinical and translational research study. However, medical research studies sometimes report statistical analysis that is either inappropriate or insufficient to attest to the accuracy and validity of findings and conclusions. Published works

involving inaccurate statistical analyses and insufficient reporting influence the conduct of future scientific studies, including meta-analyses and medical decisions. Although the biostatistical practice has been improved over the years due to the involvement of statistical reviewers and collaborators in research studies, there remain areas of improvement for transparent reporting of the statistical analysis section in a study. Evidence-based biostatistics practice throughout the research is useful for generating reliable data and translating meaningful data to meaningful interpretation and decisions in medical research. Most existing research reporting guidelines do not provide guidance for reporting methods in the statistical analysis section that helps in evaluating the quality of findings and data interpretation. In this report, we highlight the global and critical steps to be reported in the statistical analysis of grants and research articles. We provide clarity and the importance of understanding study objective types, data generation process, effect size use, evidence-based biostatistical methods use, and development of statistical models through several thematic frameworks. We also provide published examples of adherence or non-adherence to methodological standards related to each step in the statistical analysis and their implications. We believe the suggestions provided in this report can have far-reaching implications for education and strengthening the quality of statistical reporting and biostatistical practice in medical research.

Keywords: Biomedical Research; Biostatistics; Education, Medical; Medicine; Research.

3. *Luków P. Solidarity and the ethics of exposing others to risk in medical research. Bioethics. 2022 Oct;36(8):821-828. doi: 10.1111/bioe.13049. Epub 2022 May 16.*

ABSTRACT

The ethical justifiability of the invitation of others to participate in research and their deliberate exposure to risks of harm is not a common topic in bioethics. If, however, some offers ought not to be made and the corresponding actions ought not to be facilitated, invitations to, and the conduct of, a medical study involving humans needs justification. This paper addresses this issue by linking the search for medical knowledge with solidarity. The argument begins with the observation that scientific research is aimed at general knowledge, which is a necessary condition of the social value of research. The applicability of this knowledge to many makes it potentially a public good; that is, a good that is available freely to all. For knowledge to be a public good, a social decision to make it freely available to all needs to be made. It is proposed that this decision be grounded in society's, and so in both researchers' and potential research participants', commitment to solidarity and its obligations of provision, sharing, support, and loyalty. These obligations imply, among other things, an imperfect obligation to participate in research and the corresponding entitlement of the investigators to invite

others to participate in research, and so to expose them to its risks during implementation. This entitlement is exercised in an environment shaped by the standards and protections of research ethics and the relevant institutional arrangements.

Keywords: exposure to risk; human experimentation; medical knowledge; medical research; solidarity.

4. *AlQirem L, Al-Huneidy L, Hammouri M, Taha H, Al-Somadi H, Al-Bitar F, et al. Perceived barriers towards the importance and application of medical research: a source of gender disparity among medical undergraduates. BMC Med Educ. 2022 Nov 8;22(1):767. doi: 10.1186/s12909-022-03822-9.*

ABSTRACT

Background: Little is known about gender disparity among medical undergraduates in the developing world. Therefore, this study aims to explore the attitudes and perceived barriers among Jordanian medical students, particularly women.

Methods: An online, self-administered questionnaire, developed after an extensive literature review, was disseminated across all six Jordanian medical schools targeting more than 5000 medical students. Student t-test and ANOVA were used to document mean differences among different groups. Linear and logistic regression models were used to find predictors of publication and number of publications.

Results: A total of 636 students participated in the survey with a women to men ratio of 1.1. Women medical students report significantly higher knowledge ($t(634) = 2.47, p = 0.013$), personal ($t(634) = 3.31, p = 0.001$), and total barriers scores than men ($t(634) = 3.02, p = 0.003$). Moreover, compared to men, women were less likely to find same-sex mentorship ($t(634) = 3.18, p = 0.001$) or receive credited authorship ($t(634) = 2.12, p = 0.011$). Overall, women medical students were more likely to perceive that their gender ($t(634) = 3.58, p < 0.001$) and people's perception of their gender ($t(634) = 4.25, p < 0.001$) are barriers to their career advancement. Binary logistic regression demonstrated that gender is a significant predictor of being able to publish (OR: 1.645; 95%CI: 1.002-2.731), while linear regression demonstrated that gender is a predictor of number of publications (β : 0.113; 95%CI: 0.063-0.288).

Conclusion: A significant gender disparity exists in terms of both attitudes and overall barriers among Jordanian medical undergraduates which calls for immediate policy changes as to produce successful clinicians and researchers.

Keywords: Medical Education Research; Medicine; Mentoring; Undergraduates.

5. *Wong ND. Evolution of Coronary Calcium Screening for Assessment of Atherosclerotic Cardiovascular Disease Risk and Role in Preventive Cardiology. Curr Atheroscler Rep. 2022 Dec;24(12):949-957. doi: 10.1007/s11883-022-01073-z. Epub 2022 Nov 14.*

ABSTRACT

Purpose of review: Coronary artery calcium (CAC) is an important measure of subclinical atherosclerosis and strongly predicts atherosclerotic cardiovascular disease (ASCVD) outcomes. The purpose of this review is to discuss the key studies that have helped to establish its role as an important screening tool and its place in preventive cardiology.

Recent findings: Epidemiologic studies document a strong relation of age, race/ethnicity, and risk factors with the prevalence and extent of CAC. Large-scale registry and prospective investigations show CAC to be the strongest subclinical disease predictor of ASCVD outcomes, with higher CAC scores associated with successively higher risks and those with a CAC score of 0 having a long-term "warranty" against having events. Moreover, CAC is associated with greater initiation of preventive health behaviors and therapy. Current US guidelines utilize CAC to inform the treatment decision for statin therapy. Further study is underway to document whether CAC screening will ultimately improve clinical outcomes. CAC is well established as the most important subclinical cardiovascular disease measure for prediction of future ASCVD outcomes and can be used for informing the treatment decision for preventive therapies.

Keywords: Atherosclerosis; Cardiovascular disease; Coronary calcium; Epidemiology; Risk factors.

6. *von Lewinski D, Kolesnik E, Tripolt NJ, Pferschy PN, Benedikt M, Wallner M, et al. Empagliflozin in acute myocardial infarction: the EMMY trial. Eur Heart J. 2022 Nov 1;43(41):4421-4432. doi: 10.1093/eurheartj/ehac494.*

ABSTRACT

Aims: Sodium-glucose co-transporter 2 inhibition reduces the risk of hospitalization for heart failure and for death in patients with symptomatic heart failure. However, trials investigating the effects of this drug class in patients following acute myocardial infarction are lacking.

Methods and Results: In this academic, multicentre, double-blind trial, patients ($n = 476$) with acute myocardial infarction accompanied by a large creatine kinase elevation (>800 IU/L) were randomly assigned to empagliflozin 10 mg or matching placebo once daily within 72 h of percutaneous coronary intervention. The primary outcome was the N-terminal pro-hormone of brain natriuretic peptide (NT-proBNP) change over 26 weeks. Secondary outcomes included changes in echocardiographic parameters. Baseline median (interquartile range) NT-proBNP was 1294 (757-2246) pg/mL. NT-proBNP reduction was significantly greater in the empagliflozin group, compared with placebo, being 15% lower [95% confidence interval (CI) -4.4% to -23.6%] after adjusting for baseline NT-proBNP, sex, and diabetes status ($P = 0.026$). Absolute left-ventricular ejection fraction improvement was significantly greater (1.5%, 95% CI 0.2-2.9%, $P = 0.029$), mean E/e' reduction was 6.8% (95% CI 1.3-11.3%, $P = 0.015$) greater, and left-

ventricular end-systolic and end-diastolic volumes were lower by 7.5 mL (95% CI 3.4-11.5 mL, $P = 0.0003$) and 9.7 mL (95% CI 3.7-15.7 mL, $P = 0.0015$), respectively, in the empagliflozin group, compared with placebo. Seven patients were hospitalized for heart failure (three in the empagliflozin group). Other predefined serious adverse events were rare and did not differ significantly between groups.

Conclusion: In patients with a recent myocardial infarction, empagliflozin was associated with a significantly greater NT-proBNP reduction over 26 weeks, accompanied by a significant improvement in echocardiographic functional and structural parameters.

Clinicaltrials.gov registration: NCT03087773.

Keywords: Clinical Trial; Empagliflozin; Heart Failure; Myocardial Infarction; NT-proBNP; Randomised Controlled Trial.

7. **Kronenberg F, Mora S, Stroes ESG, Ference BA, Arsenaault BJ, Berglund L, et al. Lipoprotein(a) in atherosclerotic cardiovascular disease and aortic stenosis: a European Atherosclerosis Society consensus statement. Eur Heart J. 2022 Oct 14;43(39):3925-3946. doi: 10.1093/eurheartj/ehac361.**

ABSTRACT

This 2022 European Atherosclerosis Society lipoprotein(a) [Lp(a)] consensus statement updates evidence for the role of Lp(a) in atherosclerotic cardiovascular disease (ASCVD) and aortic valve stenosis, provides clinical guidance for testing and treating elevated Lp(a) levels, and considers its inclusion in global risk estimation. Epidemiologic and genetic studies involving hundreds of thousands of individuals strongly support a causal and continuous association between Lp(a) concentration and cardiovascular outcomes in different ethnicities; elevated Lp(a) is a risk factor even at very low levels of low-density lipoprotein cholesterol. High Lp(a) is associated with both microcalcification and macrocalcification of the aortic valve. Current findings do not support Lp(a) as a risk factor for venous thrombotic events and impaired fibrinolysis. Very low Lp(a) levels may associate with increased risk of diabetes mellitus meriting further study. Lp(a) has pro-inflammatory and pro-atherosclerotic properties, which may partly relate to the oxidized phospholipids carried by Lp(a). This panel recommends testing Lp(a) concentration at least once in adults; cascade testing has potential value in familial hypercholesterolaemia, or with family or personal history of (very) high Lp(a) or premature ASCVD. Without specific Lp(a)-lowering therapies, early intensive risk factor management is recommended, targeted according to global cardiovascular risk and Lp(a) level. Lipoprotein apheresis is an option for very high Lp(a) with progressive cardiovascular disease despite optimal management of risk factors. In conclusion, this statement reinforces evidence for Lp(a) as a causal risk factor for cardiovascular outcomes. Trials of specific Lp(a)-lowering treatments are critical to

confirm clinical benefit for cardiovascular disease and aortic valve stenosis.

Keywords: Aortic Stenosis; Cardiovascular Risk; Clinical Guidance; Consensus; Lipoprotein(a); Model of Care; Testing; Treatment.

8. **Chen Y, Phoon PHY, Hwang NC. Heparin Resistance During Cardiopulmonary Bypass in Adult Cardiac Surgery. J Cardiothorac Vasc Anesth. 2022 Nov;36(11):4150-4160. doi: 10.1053/j.jvca.2022.06.021. Epub 2022 Jun 24.**

ABSTRACT

The use of heparin for anticoagulation has changed the face of cardiac surgery by allowing a bloodless and motionless surgical field throughout the introduction of cardiopulmonary bypass (CPB). However, heparin is a drug with complex pharmacologic properties that can cause significant interpatient differences in terms of responsiveness. Heparin resistance during CPB is a weighty issue due to the catastrophic consequences stemming from inadequate anticoagulation, and the treatment of it necessitates a rationalized stepwise approach due to the multifactorial contributions toward this entity. The widespread use of activated clotting time (ACT) as a measurement of anticoagulation during CPB is examined, as it may be a false indicator of heparin resistance. Heparin resistance also has been repeatedly reported in patients infected with COVID-19, which deserves further exploration in this pandemic era. This review aims to examine the variability in heparin potency, underlying mechanisms, and limitations of using ACT for monitoring, as well as provide a framework towards the current management of heparin resistance.

Keywords: COVID-19; Activated Clotting Time; Albumin; Anticoagulation; Antithrombin.

9. **Milne B, Gilbey T, Kunst G. Perioperative Management of the Patient at High-Risk for Cardiac Surgery-Associated Acute Kidney Injury. J Cardiothorac Vasc Anesth. 2022 Dec;36(12):4460-4482. doi: 10.1053/j.jvca.2022.08.016. Epub 2022 Aug 28.**

ABSTRACT

Acute kidney injury (AKI) is one of the most common major complications of cardiac surgery, and is associated with increased morbidity and mortality. Cardiac surgery-associated AKI has a complex, multifactorial etiology, including numerous factors such as primary cardiac dysfunction, hemodynamic derangements of cardiac surgery and cardiopulmonary bypass, and the possibility of a large volume of blood transfusion. There are no truly effective pharmacologic therapies for the management of AKI, and, therefore, anesthesiologists, intensivists, and cardiac surgeons must remain vigilant and attempt to minimize the risk of developing renal dysfunction. This narrative review describes the current state of the scientific literature concerning the specific aspects of cardiac surgery-associated AKI, and presents it in a chronological fashion to

aid the perioperative clinician in their approach to this high-risk patient group. The evidence was considered for risk prediction models, preoperative optimization, and the intraoperative and postoperative management of cardiac surgery patients to improve renal outcomes.

Keywords: Acute Kidney Injury; Cardiac Surgery; Cardiopulmonary Bypass; Perioperative Risk Stratification; Renal Replacement Therapy.

10. *Connolly N, Abdalla ME. Impact of COVID-19 on medical education in different income countries: a scoping review of the literature. Med Educ Online. 2022 Dec;27(1):2040192. doi: 10.1080/10872981.2022.2040192.*

ABSTRACT

The COVID-19 pandemic has disrupted medical education worldwide. Universities were forced to rapidly adapt to the evolving situation and develop methods of delivering curricula and assessments online. The purpose of this scoping review was to assess the impact of COVID-19 on medical education and investigate how this effect varies in different income countries. The methodology adhered to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) extension for scoping reviews. Key terms were searched in six electronic databases. Inclusion criteria included studies describing the effect of COVID-19 on undergraduate medical education in university and clinical settings, studies published post 1 December 2019 and studies published in English. A modified Johanna Briggs Institute data charting tool was used to extract data concerning study characteristics and outcomes. The initial search returned 298 articles. Following duplicate removal and article screening, 33 studies were included. The literature indicated that the pandemic had a negative effect on medical student education worldwide, in both high-income countries (HICs) and low- and middle-income countries (LMICs). A range of factors impacted students and educators, including new curriculum and assessment design, reduced patient contact, use of new technology and lack of infrastructure. However, LMICs encountered more arduous barriers such as lack of access to information technology infrastructure and support from national governments. COVID-19 has impeded medical education worldwide. Future research is needed to address barriers to providing medical education during a pandemic. LMICs need particular support as they have fewer resources and face greater challenges regarding this matter.

Keywords: COVID-19; coronavirus; education; high-income; low-income; medical; middle-income; students; teachers; technology.

11. *Bazargan-Hejazi S, Manriquez JAN, McDermoth-Grimes M, Parra EA, Prothrow-Stith D. Underrepresented in medicine students' perspectives on impactful medical education. BMC Med Educ. 2022 Dec 30;22(1):904. doi: 10.1186/s12909-022-03983-7.*

ABSTRACT

Background: Exploring the perceptions of underrepresented in medicine (URiM) students about the medical education curriculum and learning environment could optimize their education outcomes. The current study delineated perceptions of URiM medical students about the unique elements and characteristics of an impactful medical education program that create a positive, supportive learning environment culture.

Methods: We conducted in-depth interviews with 15 URiM students between January 2018 and April 2018. Interviewees were recruited from an accredited medical education program in Historically Black Colleges and Universities (HBCUs). The University is also a member of the Hispanic Association of Colleges and Universities in the U.S. The main question that guided the study was, "What do URiM students at a Historically Black Colleges and Universities (HBCU) medical school believe would make a medical education program (MEP) impactful?" We used the grounded theory analytical approach and performed content analysis via qualitative thematic evaluation.

Results: Of 112 enrolled medical students (MS), 15 verbally consented to participation. We identified four general themes and several subthemes. The themes include 1) Grounding learning in the community; 2) Progressive system-based practice competency; 3) Social justice competency and 4) Trauma-informed medical education delivery. Theme 1 included the following subthemes (a) community engagement, and (b) student-run clinic, mobile clinic, and homeless clinic rotations. Theme 2 includes (a) interprofessional learning and (b) multidisciplinary medicine for cultivating a 'just' healthcare system. Theme 3 includes (a) longitudinal social justice curriculum, (b) advocacy, and (c) health disparity research. Theme 4 had the following subdomains (a) early and ongoing mentoring and (b) provision of supportive policies, services and practices to maximize learning and mental health.

Conclusion: Our learners found that social justice, trauma-informed, community-based curricula are impactful for URiM learners. These findings highlight the need for further research to assess the impact of permeating the championship culture, community cultural wealth, and transformational education in all aspects of the MEP in providing a supporting and positive learning environment for URiM students.

Keywords: Black; Curriculum; Latino; Learning; Medical Education; Medical Students; Medicine; Racial minorities; Underrepresented.