

MIDOCEAN UNIVERSITY

College of Management
Master of Health Administration (MHA)

Research Ethics Report

Ethical Dimensions of Implementing Precision Medicine in Healthcare Systems: A Scoping Review Perspective

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1. Introduction

Research ethics refers to the set of moral principles, professional standards, and institutional regulations that govern how scientific inquiry is conducted. In practical terms, it is the framework that ensures the pursuit of knowledge does not come at the expense of honesty, accuracy, or the welfare of those affected by the research. Ethical research conduct includes honesty in reporting, methodological transparency, protection of participants, and responsible data stewardship (American Psychological Association, 2017; Steneck, 2006). These principles are not optional extras; they are what makes research credible in the first place.

In health systems research, these obligations carry particular weight. Studies that inform clinical practice, health policy, or resource allocation have real consequences for real populations. When ethical standards are compromised, the damage extends beyond the individual researcher: it erodes institutional credibility, distorts the evidence base that practitioners depend on, and can ultimately harm the communities that research is designed to serve.

This report examines the core principles and practical dimensions of research ethics as they apply to a master's-level scoping review currently underway at Midocean University. The study is titled *Implementing Precision Medicine in Healthcare Systems: Organizational Readiness, Governance, and Operational Challenges*. The report explains why research ethics matters, outlines the key principles and common ethical challenges, reviews the governing regulatory frameworks, and applies those principles directly to the scoping review's methodology and design.

2. Importance of Research Ethics

The importance of research ethics operates at three interconnected levels: individual, institutional, and societal.

At the individual level, research ethics protects the integrity of the researcher. A researcher who fabricates data, misrepresents sources, or suppresses inconvenient findings does not simply produce a flawed study. They damage their own credibility in ways that are difficult to recover from, and they undermine the body of work they have spent years building.

At the institutional level, research ethics sustains the credibility of the universities, journals, and funding bodies that produce and publish research. These institutions depend on the basic

assumption that published findings are honest and replicable. When that assumption is violated, as it has been in documented cases of data fabrication in medical research, the damage spreads across entire fields and takes years to repair (Steneck, 2006).

At the societal level, research ethics is directly tied to the welfare of the populations that research is meant to benefit. In health systems research, flawed or dishonest findings can misdirect clinical guidelines, skew resource allocation, and push policy in harmful directions. A study that misrepresents what conditions are needed for successful precision medicine implementation pulls limited healthcare resources away from where they are actually needed. In the GCC context, where national health transformation programs depend on evidence-based planning, this matters considerably.

3. Core Principles of Research Ethics

The following five principles are most directly relevant to health systems and biomedical research.

3.1 Scientific Honesty

Scientific honesty requires that researchers report their methods, findings, and conclusions accurately, without distortion, exaggeration, or selective omission. This applies at every stage of the research process.

Example: A researcher conducting a scoping review on precision medicine honestly reports that the evidence base is dominated by North American and Western European settings, and that findings may not generalise well to GCC contexts, rather than overstating the review's policy relevance.

3.2 Integrity

Integrity means consistency between what a researcher commits to doing and what they actually do. A researcher with integrity follows their pre-registered methodology, applies eligibility criteria consistently, and codes data the same way across all included studies regardless of whether the results match expectations.

Example: If the evidence synthesis suggests that one of the proposed framework domains is poorly supported, integrity requires revising it to reflect what the evidence actually shows, rather than selectively reporting findings to defend the original structure.

3.3 Objectivity

Objectivity means allowing the evidence to guide conclusions rather than interpreting data to confirm pre-existing beliefs. Complete objectivity is not fully achievable, but methodological safeguards such as pre-defined search strategies, inter-rater reliability checks, and transparent coding frameworks significantly reduce the risk of bias.

Example: In a scoping review, objectivity is built into the methodology through a multi-database search strategy that does not selectively retrieve studies aligned with a preferred conclusion about precision medicine readiness.

3.4 Confidentiality

Confidentiality requires that information shared by research participants, or obtained through access to sensitive data, is protected and used only for stated research purposes. In secondary research such as scoping reviews, this applies mainly when grey literature sources include internal organisational documents shared under conditions of restricted use.

Example: If a healthcare organisation shares an internal implementation report as a grey literature source, the researcher must use that document only within the permitted scope and must not disclose identifying organisational details beyond what the research requires.

3.5 Informed Consent

Informed consent requires that research participants take part voluntarily, with a clear understanding of the study's purpose, risks, benefits, and their right to withdraw at any time without consequence. It is a formal requirement under institutional review boards worldwide.

Example: In a future primary research phase of this study, if healthcare administrators in Saudi Arabia are surveyed about organisational readiness for precision medicine, each participant would need to receive a clear information sheet and provide written consent before data collection begins.

4. Ethical Issues in Scientific Research

4.1 Plagiarism

Plagiarism means presenting the ideas, language, or work of others as your own without proper acknowledgment. It ranges from direct copying to subtler forms such as paraphrasing without citation, self-plagiarism, and mosaic plagiarism.

Example: A researcher who paraphrases paragraphs from a 2019 Lancet article on genomic medicine implementation without citing the source is committing plagiarism, even if no words are copied verbatim.

4.2 Data Fabrication and Falsification

Data fabrication means inventing data that were never collected. Falsification means manipulating or selectively reporting real data to misrepresent findings. Both are fundamental violations of scientific integrity and can lead to patient harm when fabricated findings influence clinical practice.

Example: A researcher who reports 95 included studies when only 60 met eligibility criteria, to make the evidence base appear more comprehensive, is falsifying their findings.

4.3 Bias

Research bias refers to systematic errors in study design, data collection, analysis, or interpretation that consistently push findings in a particular direction. In scoping reviews, publication bias is a well-recognised concern: positive implementation outcomes are far more likely to be published than failures or inconclusive results.

Example: A scoping review that searches only PubMed will systematically underrepresent management and policy literature indexed in other databases, producing a synthesis biased toward clinical perspectives.

4.4 Privacy Violations

Privacy violations occur when research collects, uses, or discloses personal or organisational information beyond what participants consented to, or in ways that expose them to harm. In genomic research, these concerns are especially serious because genomic data are uniquely identifying and carry implications for biological relatives.

Example: A precision medicine study that shares raw genomic data with third parties without explicit consent violates participant privacy. In GCC populations, where genetic data may affect extended families and carry social consequences, these risks are more significant than standard Western consent frameworks anticipate.

4.5 Conflict of Interest

A conflict of interest exists when a researcher's personal, financial, or professional interests could inappropriately influence how they design, conduct, or report research. Conflicts must be disclosed so that readers can assess the potential for bias.

Example: A researcher with a financial stake in a precision medicine company who studies that company's platform has a conflict of interest that must be declared. For the present study, this is addressed in full in Section 6.8.

5. Regulations and Frameworks Governing Research Ethics

5.1 Institutional Review Boards and Ethics Committees

Institutional Review Boards (IRBs), known in many settings as Research Ethics Committees (RECs), are independent bodies that review research proposals involving human subjects. They evaluate whether risks to participants are minimised and justified by the research's benefits, whether informed consent procedures are adequate, and whether vulnerable populations receive appropriate additional safeguards.

In Saudi Arabia, research involving humans, biological samples, genetic material, or living creatures is governed primarily through the National Committee of Bioethics (NCBE) and registered Local Ethics Committees, operating under the Law of Ethics of Research on Living Creatures (National Committee of Bioethics [NCBE], n.d.). For the present scoping review, no ethics approval is required because the study involves no human participants; it synthesises published and publicly available literature. However, any future primary research phase, such as surveys or interviews with healthcare administrators, or any use of identifiable health or genomic data, would be submitted to a registered ethics committee for review before data collection begins.

5.2 APA Ethical Principles

The American Psychological Association's Ethical Principles of Psychologists and Code of Conduct (APA, 2017) provides a widely adopted framework for research ethics that extends into health and social sciences research. The APA principles cover honesty and accuracy in science, avoiding harm, respecting participant autonomy and dignity, protecting confidentiality, and reporting findings completely and accurately. The present research follows APA 7th edition citation standards throughout (American Psychological Association, 2020), and its methodology is designed to align with these principles.

5.3 PRISMA-ScR Reporting Standards

For scoping reviews specifically, the PRISMA Extension for Scoping Reviews (PRISMA-ScR) operationalises transparency and reproducibility as concrete reporting requirements (Tricco et al., 2018). PRISMA-ScR requires documentation of how the search was conducted, how many records were retrieved and screened at each stage, how eligibility decisions were made, and how the evidence was synthesised. Following PRISMA-ScR is itself an ethical commitment to reproducibility and honest reporting.

6. Practical Application to the Research

This section applies the principles and frameworks above to the specific methodological choices and ethical obligations of the scoping review on precision medicine implementation. It addresses transparency, bias management, screening reliability, attribution, secondary data ethics, confidentiality, equity, Islamic bioethical considerations, conflict of interest, and potential risks.

6.1 Pre-Registration and Transparency

Before formal screening and data extraction begin, the protocol will be deposited on the Open Science Framework (OSF). Any subsequent amendments will be dated, documented, and justified. This publicly commits the researcher to the search strategy, eligibility criteria, and analytical framework before any data decisions are made, directly operationalising the principles of integrity and objectivity. Pre-registration prevents the post-hoc adjustment of methods to fit the results and creates a permanent external record against which the published report can be checked. It addresses one of the most common forms of misconduct in evidence synthesis: quietly modifying inclusion criteria or coding frameworks after seeing which findings they would produce.

6.2 Systematic Search and Publication Bias

The research will use four bibliographic databases, PubMed/MEDLINE, Scopus, Web of Science, and CINAHL, supplemented by Google Scholar and hand-searching of reference lists. No single database covers the full breadth of clinical, implementation science, and health management literature relevant to this review. The inclusion of Google Scholar and grey literature sources specifically addresses publication bias, since successful implementation outcomes are far more likely to reach peer-reviewed publication than failed programs or inconclusive findings. The limitations section will acknowledge honestly that publication bias cannot be fully eliminated.

6.3 Inter-Rater Reliability and Screening Consistency

A second reviewer will independently screen a random sample of at least 20% of retrieved records at the title-and-abstract stage. Inter-rater agreement will be calculated as a kappa statistic and reported in the methodology section. This safeguard reduces the risk that the included sample reflects the primary researcher's pre-existing assumptions rather than a consistent application of the eligibility criteria. Where disagreements arise, they will be resolved through discussion and recorded.

6.4 Attribution and Plagiarism Prevention

All sources, including grey literature, policy documents, and published studies, will be cited in APA 7th edition format. The data extraction charting form will record the exact source for every finding coded during the synthesis, so that attribution is maintained throughout the analytical process. The study explicitly acknowledges its theoretical foundations in Weiner (2009), Damschroder et al. (2009), and Leavitt (1965), and the preliminary Implementation Readiness Framework is presented as building on those foundations, not as an independent invention.

6.5 Secondary Research and Confidentiality

As a scoping review, this study involves no primary data collection from human participants, which removes the need for informed consent procedures and individual data protection protocols. Ethical obligations that remain include honest representation of the studies reviewed, avoiding distortion of other researchers' findings, transparent documentation of methodological choices, and honest acknowledgment of limitations. Where grey literature sources carry explicit confidentiality restrictions, those documents will be excluded from the review unless explicit permission for their use is obtained.

6.6 Equity and Population Representation

One of the most substantive ethical dimensions of this research concerns the representativeness of the global evidence base for GCC populations. As documented by Popejoy and Fullerton (2016), European-ancestry individuals accounted for approximately 80% of genome-wide association study participants at the time of their analysis, despite representing less than 20% of the global population. This is not simply a data gap; it is an ethical problem. Precision medicine tools built on European-ancestry genomic data may produce substantially lower accuracy for Gulf populations, potentially resulting in incorrect risk predictions and clinical harm. The literature synthesis will include a dedicated content analysis strand examining how

equity and population representation are addressed in the implementation literature, and the GCC contextual interpretation section will explicitly flag where Western findings may not transfer reliably to Gulf health systems.

6.7 Islamic Bioethical Principles and Consent Frameworks

Standard genomic consent frameworks, developed predominantly in North American and European settings, are built on assumptions of individual autonomy that may not align with Islamic bioethical principles, which tend to place significant weight on family interests in genetic information, communal decision-making, and obligations around disclosing genetic risk to relatives (Al-Bar & Chamsi-Pasha, 2015; Ghaly, 2016). These are not surface-level cultural differences; they affect the fundamental design of consent processes and ethics governance structures. The research treats this as a genuine governance challenge rather than a cultural footnote, and explicitly identifies the absence of practical implementation guidance for Saudi and GCC administrators as a gap in the existing literature.

6.8 Conflict of Interest Disclosure

The researcher has a prospective professional interest in precision genomics innovation, which may create an intellectual conflict of interest. This potential interest is disclosed to ensure transparency and is managed through the safeguards described below. The specific risk is that the researcher might, consciously or unconsciously, frame findings favourably toward precision medicine adoption, overstate GCC health system readiness, or downplay barriers that complicate implementation. This risk is managed through four structural safeguards: prospective OSF registration will commit the methodology before formal screening and data-extraction decisions are made; multi-database searching prevents selective evidence retrieval; independent duplicate screening by a second reviewer of a random sample of at least 20% of retrieved records reduces individual judgement bias; and the analytical propositions explicitly direct attention toward equity and access gaps. These safeguards do not eliminate the conflict, but they make it structurally difficult for it to distort findings without leaving a visible and auditable trace.

6.9 Potential Risks and Mitigation

The main ethical and methodological risks in this scoping review are: selection bias in the included sample, overgeneralisation of Western implementation findings to GCC health systems, misrepresentation of other authors' findings during synthesis, and conflict of interest arising from the researcher's professional involvement in precision medicine. These risks are

mitigated through transparent eligibility criteria and prospective protocol registration before formal screening, a multi-database search strategy, full source attribution throughout the extraction process, a dedicated GCC contextual interpretation section that explicitly limits the transferability of Western findings, explicit limitation reporting, and the conflict of interest disclosure and safeguards described in Section 6.8.

7. Conclusion

Research ethics is not a procedural requirement that researchers satisfy and move on from. It is a set of substantive commitments that determine whether research actually delivers on its purpose: producing reliable, honest, and useful knowledge that serves the communities it is designed to benefit. For a scoping review on precision medicine implementation in GCC health systems, those commitments take specific and practical forms, including prospective protocol registration before formal screening, systematic and transparent search design, honest attribution of all sources, acknowledgment of publication bias and geographic limitations, disclosure of conflict of interest, and dedicated attention to the equity and ethical dimensions of genomic research in populations the global literature has underserved.

What this report demonstrates is that ethical conduct and rigorous methodology are not separate activities. Every safeguard described, from pre-registration through inter-rater reliability to the GCC contextual interpretation, is simultaneously a methodological decision and an ethical one. This integration is what distinguishes research that is genuinely trustworthy from research that merely appears so.

As this study moves toward publication and eventually toward future primary research phases, the ethical commitments described here will continue to guide each step. The health systems, administrators, and patients whose welfare depends on the integrity of precision medicine implementation research deserve work conducted with the same rigour expected of the programs it is designed to inform.

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