Incorporating Genomic Literacy In The Learning Process: Time to Move Forward in Molecular & Genomic Medicine

A little genomic literacy like "G to C" and "A to T" with orthodox "U" RNA signature is the future ABC for everyone. Since the kick start, Watson and Crick's model of DNA and Emmanuelle Charpentier and Jenifer Doudna's invention of CRISPR/Cas gene editing technology thus confirmed our lead to novel molecular and genomic sciences.[1] While the genomic tracks are being beaten in labs, there is an even exigence to expand the broadcast to early learners. There is a feeling of absolute resoluteness in developing a trickle-down tsunami-like ripple effect for policy-level document creation with governmental oversight to prevail "genomic literacy" in early learning. A non-biologist learner must decipher at least their "Genome" and the tremendous powers it shelters for them for guardianship, ethical use and medical learning. Knowledge, therefore, remains the core pivot, allowing the precise application of genomic medicine. "Genomic literacy" is defined as knowledge and data pertaining to genomic alterations helping patients in specific and citizens, in general, to make informed decisions about their underlying genetic disorders in the light of genetic and disease-specific research to define evidence-based decision-making for a specific disease with information about all possible therapeutic options.[2,3]

Genomics is an advancing field of medicine, science, ethics, and legislation. Keeping up to date with this challenging discipline requires continuous education and knowledge exchange between many target groups. Specific challenges in genomic education include tailoring complex topics to diverse audiences ranging from the general public and patients to highly education. "Genomic literacy" has earlier been defined specifically in 1996 by "The National Research Council" (US), later updated by "The Institute of Medicine" committee on Health Literacy (2004), and others.[4,5] The current definition of genomic medicine is the capacity to gather, process, interpret/understand, and incorporate genomic data evidence for healthcare decision making. Over time, the concept of genomic medicine has been expanded to include patient preferences related to social, ethical and legal aspects.[1,2]

Currently, some consensus has been achieved to address genomic literacy at different levels of learning stages, excluding professional education in genomic sciences and molecular disciplines. The primary initiative here remains the "kickstart", where the primary education curriculum is considered the foundation stone to improvise and incorporate the basic knowledge of genomics in early-life education. The concept of gene, genome, DNA and similar basic terminologies must be introduced at the early education level. In addition, if not to be added as a separate subject, genomics education still demands an ongoing expansion through coverage of novel molecular techniques, pros and cons and how the knowledge can modify life in the near years to come. Undergrads must be given a specified option to select this option, which could take on to master and doctorate level, thus supplanting the genomic industrial economy from self-sufficiency to imports.[6] Genomic medicine and molecular pathology must also be singled out for fast-track incorporation into healthcare practice to address local resilience in care provision and the much-needed foreign markets due to prevailing lower purchasing power parity (PPP). Continuous Professional Development, translational research and incorporation into clinical practice should be an ongoing venture for innovative market attractions with wholesome media attraction via advertisements to allow a trickle-down impact on common people. We also suggest a nationwide genomic centre to meet the futuristic markets in terms of diagnostics, gene therapy, education, clinical training, and biotechnology development to bridge science under one umbrella cover.[5] This not only emphasizes the need for genomic literacy via supplementing existing national education but also defines step-wise education, research, scientific collaboration, biotechnological transformation, and developing regulations to cage the "Genomic Science Power".

In conclusion, genomic sciences are here on earth and bound to stay. As suggested earlier, we must focus our endeavours on making our patients clients to allow genomic medicine-based clinical practice as much as possible. This little "persuasive writing" also attempts to incorporate additional modifications within educational syllabi to innovate existing science and generate nationwide genomic project developments and much-needed laws to govern the optimized use of

this new budding technology like sequencing.[7] These practices could contribute to patient empowerment, public engagement, developing advocacy in Genomics, and finally, allowing the stage for the detailed build-up of the "Genomic Service Model" within Pakistan. We must acknowledge the vast arena of Genomic Science across various professions and healthcare industrial domains, which conventional education could not cover in greater depth. However, this persuasive editorial writeup is meant to be the "Whistleblower" for policy definition creators and students in the budding to incorporate this new dimension to life data with much more persuasiveness. This should allow the country to gain in economic terms and be a business hub in the shape of outsourced samples from countries with higher purchasing parity to boost "Medical Tourism" and the quality of healthcare service. The "INITATIVE", taken timely, can allow us to take the lead in the region.

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Corresponding Authors

Dr Sikandar Hayat Khan

Department of Chemical Pathology & Endocrinology
Armed Forces Institute of Pathology/
National University of Medical Sciences (NUMS)
Rawalpinid Pakistan

Co-Author

Dr Muhammad Qaiser Alam Khan

Department of Chemical Pathology & Endocrinology
Armed Forces Institute of Pathology/
National University of Medical Sciences (NUMS)
Rawalpinid Pakistan