Outlook and Perspective

Role of nurses in precision health

Introduction

Over the last 10 years, the health care sector has undergone major developments arising from numerous causes including the increasing implementation of electronic health medical files, the opioid crisis, and the roll-out of the Affordable Care Act. These shifts have heavily affected doctors’ and other health professionals’ day-to-day duties, with many finding it difficult to meet the pressures put upon them. It is easy to disregard that healthcare underwent a much more incremental and deeper change in this context. This transition is inexorably pushing medicine from a practice in which personalized patient treatment is guided by trials and errors influenced by experiments designed to assess population results to one in which treatment is chosen based on an in-depth knowledge of human health and disease characteristics. This development, driven by the conclusion of the human genome project, has been referred to as genomic medicine, genomic health care, precision health, and precision medicine (Joyner & Paneth, 2015; Joyner, Paneth, Ioannidis, 2016).

The White House initiated the Precision Health Program in 2015, concentrating medicine on a more focused approach to genomic and other omic information-based disease prevention, awareness, and treatment (Collins FS, Varmus, 2015; Ashley, 2015). Precision medicine is a concept that refers to customized medicine focused on the particular genetic, biochemical, or omic makeup of an individual within the framework of behavioral, physical, financial, cultural, and environmental factors to help people attain well-being and optimum health (Schussler-Fiorenza Rose et al, 2019). In Lebanon, a study was carried out delineating the research done in the area of genomics and precision health specifically and have highlighted that such initiative is quite essential for the progress of the national medical field and healthcare sector. The report showed that Lebanon is advancing through confident steps, where more funding, training and interdisciplinary cooperation is required for success (Dagher, Bilani, & Zgheib, 2018).

The nursing profession is the largest sector and a significant component of health care delivery, which is the largest percentage of the practitioners. In healthcare, nurses perform a vital role in supporting, maintaining and improving health by coordinated treatment of patients, households, societies and populations. Nursing staff have encouraged, preserved and improved wellbeing through comprehensive assessment of omics (ie, biological variance) and environmental influences, as well as social and economic factors to determine their effect on genetics in order to improve health precision. Therefore, nurses, being at the frontline of provision of services across practice environments and communities, are well placed to become pioneers in providing reliable medical care (Hickey et al, 2019; Calzone et al, 2014).

The holistic nursing model to health care continues to incorporate biological heterogeneity of genetics and genomics, familial and community predictors of environmental influences and their effect on epigenetic dynamics and the conventional care framework that emphasizes on drug therapy. Nursing’s systematic approach to patient care has placed nurses as experts in tackling important Precision Medicine Initiatives (PMI) and particular health concerns where interdisciplinary cooperation is essential to effectively execute. Medical planning, in which nurses play a vital role, is crucial to meet PMI targets and quality efficiency by enhancing customized healthcare. This is done by delivering the best care, at the right time for the right patient, and by recognizing omic and environmental causes and their relationships that lead to or safeguard against challenging and complicated illnesses (Phillips et al., 2020).

Effective adoption of precision health includes interdisciplinary cooperation, patient outreach activities, and planning that is well-positioned for nursing to guide. Given the spike in importance and commitment to accurate health omics, most nurses are not well equipped with precision health targets or its relevance to research and practice of nursing (Fu et al, 2020). The aim of this paper is to offer an illustration of precision health and the value of involving the nursing sector to enhance patients’, households’, neighborhoods’ and
peoples' customized high caliber health care services.

**Precision Health**

Precision health, an extension of precision medicine, blends genetic and genomic sequencing, protein, metabolite, and microbiome knowledge—commonly referred to as "omics"—with behavioral, physical, financial, cultural, and environmental variables. Such information may be provided by tracking tools, clinical knowledge from digital medical documents, in order to provide accurate molecular taxonomies describing a patient's diagnostic, care and mitigation (Ho et al, 2020). Nurse leadership defined precision health as a target for progressing nursing research as it addresses human heterogeneity in physical and contextual features, including diet, current comorbid conditions, biomarkers, mental and affective influences, and genetic, epigenetic, and other omic influences. Effective development of precision health needs interdisciplinary partnerships with analytical data science, computational biology, data analysts, genomics medicine, and a variety of specialists in multidisciplinary healthcare fields in which nursing plays a key position. Nurse researchers and leaders are well trained and skilled to perform clinical and translational studies, educate patients and families, employ participants and track patient wellbeing and complications in interventional trials, and act as effective representatives for patients, family members, societies, and nations. Although the introduction of precision medicine is a tremendous opportunity for nurse practitioners and nurse leadership to improve nursing practice and research by revolutionary changes of health care approaches, it also raises obstacles such as the need for curriculum, instruction, omics and specific health expertise to integrate these developments into nursing care (Fu et al, 2020).

**The Role of Nurses in Precision Health**

Nurses are the primary caregivers among the healthcare team to provide comprehensive patient-centered, and family centered tailored care of high quality standards. The traditional nurses' role revolves around personalizing care to each patient and maintaining the safety and bringing out the best clinical outcomes through various nursing modalities. There are revolutionary shifts in healthcare that nurses are well placed not only to adapt to but rather pioneer guide because of their role, their experience, and the recognition they have acquired. Nurses must consider the reasons behind the transition, the requirements for paradigm shift in practices, which would be necessary for individual and system-wide performance in order to be a significant player in influencing these improvements (Salmond & Echevarria, 2017).

The overarching aim of precision health is to improve correct diagnosis and tailored care of both uncommon and chronic illnesses, and to create a comprehensive classification scheme that will comply with better understanding and usage of omic data (Rose et al, 2020). There have been important developments in training the nursing community to accelerate research findings and employment of data to promote health and wellbeing. One example is nurses studying the impact of genetic variation of genes (pharmacogenetics) or several genes at the same time (pharmacogenomics) and how this affects human reactions to therapeutics and nutrition (Cecchin, & Stocco 2020; Flores-Pérez et al, 2019). By integrating this information of clinical care, nurses are empowered to track and administer therapy with pharmacological agents to improve, preserve and advocate for the health of individuals. Thus, omic-era nursing involves an emphasis on the specific risk for disease of each patient and the efficacy of therapies depending on the particular mix of genetic/genomic and environmental predisposition of patients. Regardless of the fact that the nursing viewpoint is important for effective adoption, the initiative to incorporate nursing in PMI management still faces obstacles.

Another component of the detailed development of health information base would be developing processes to ensure that all omic monitoring and test outcome correspondence aligns with patient and family needs. This approach should commence with patient-centered conversations about the nature of particular assessments, their implications, risk / benefit factors and the implications they hope to achieve. As representatives for patients, nurses are well experienced in holding tough conversations with patients and families as well as interpreting medical language into knowledge which patients may comprehend. However, given the numerous ethical, legal and social ramifications concerning the exchange of medical records, access to data and confidentiality, it would be of utmost importance to establish scientific and clinical procedure guidelines for coping with these issues (Dewell, Benzies & Ginn, 2020).

The nurse practitioner plays a vital role in shifting the fundamental change from disease-focused care to one that uses precision medicine to avoid serious clinical diseases from emerging before they take place. It is crucial that the nurse practitioners create strategic plans to induct precision health in nursing research, academia, healthcare delivery and management and health policies in order to incorporate omic expertise into the healthcare industry. In the technological era of precision health, nurses are better prepared to guide its introduction into health education, preventative medicine and management using the
comprehensive nursing approaches. For nurses in research, teaching, clinical experience, and health policy contexts, the following guidelines are listed to transform and incorporate precision medicine into the future of care delivery (Corwin et al., 2019).

Conclusion

To sum up, nurses around the world are working to establish and adopt precision health strategies and create new information, health care systems, and techniques of interaction that can benefit patients, families, communities, and nations. Nurses are critical to the vitality of the healthcare system. Nursing functions are crucial in incorporating precision health, including correct distribution of pharmacogenetic-based therapies, presenting patient and family information on the significance of genomic or omic testing, health and family reviews including family history, and offering valuable guidance and input into the viability of introducing emerging technology into daily practices. Irrespective of the degree of readiness, nurses have a multidisciplinary teams’ role to play in promoting the priorities of precision health in any care, educational, academic, and political context. Emerging technology and technology programs are creating cutting-edge developments that allow more individuals to enhance the diagnosis and customized care. The nursing profession, as the largest sector of health care professionals, should act as a cohesive and pervasive voice in legal and secure scientific communication, disseminating omic developments around the globe in this modern age of precision medicine.

Recommendations

The researchers therefore recommend, augmenting public and private financing to help essential elements in the training of future nurse researchers who will be performing ground-breaking work in precision medicine, especially in the field of symptom science, thus in detecting, categorizing and preventing patient symptoms and control across the lifetime. Undertake nursing research determining which strategies will facilitate the best patient outcomes considering the unique omic, genetic and/or genomic, interactive, behavioral and environmental features of the patients. In addition, leadership should strive to incorporate precision health principles and expertise (genetics, genomics, omics, and data science) into all stages of nursing academics (baccalaureate, professional practice, and PhD), as suggested by regional and international context consensus recommendations for nursing (Regan et al., 2019). This involves openness to the application of genetic and/or genomic knowledge in longitudinal clinical interactions of student nurses and across the continuum of wellbeing and disease. Preparing professional nurses in a variety of health care environments to apply precision health principles including: drug administration focused on pharmacogenetics and/or pharmacogenomics, analysis of details from genetic examination results, and recognition of high-risk family records that require access to genetic evaluation.

Implications for Nursing Practice

With the provision of advanced research, diagnosis and management in precision medicine, nurses face growing difficulties and resources in interaction, treatment, and advocacy for patients. In order to deliver personalized interdisciplinary services to patients in which nurses play a vital role, nursing literacy and continued training, professional decision making, and improvements to healthcare systems would be required. Health care directed at tailored and precision medicine involves nursing and other health care professionals to be skilled and professional in their comprehension, synthesis, and implementation of these advancements in research, particularly in the application of ‘omics’-based technology.

Activating the nursing role in precision health thus enhances the provision of community health where personalized genetically oriented health campaigns can be organized and lead by highly knowledgeable nurses. This will imply the need for revising the definition of nursing practice by nurse leaders and managers. Nursing practice therefore will be guided by a new perspective on health and wellbeing, where tasks and procedures might be altered and applied differently. Such modifications might even entail various financial enhancements for nursing staff as well as might lead to cost effective healthcare services of higher quality.

Role of Funding Sources

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Credit Statement

The manuscript has been conceptualized, designed, written, reviewed and submitted by Mirna Fawaz who is the only author of this paper.
Declaration of Competing Interest

There are no conflicts of interest to report.

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Available online 19 March 2021

0029-6554/$ – see front matter  
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https://doi.org/10.1016/j.outlook.2021.01.016