Individualizing Nursing Care in the Omics Era

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BUTTERMILK: 8 ounces, every evening at bedtime.

That’s the nutrition and comfort intervention one of my undergraduate classmates prescribed on a nursing care plan, circa 1972. In response, her incredulous instructor wrote, “I assume the patient likes this?!” Apparently, the teacher didn’t share the patient’s enthusiasm for the interesting and unique sensory qualities of buttermilk—a combination of sourness, astringency, yellow–white color, lumpiness, and slow thick flow. Some individuals enjoy the buttermilk experience, and others prefer to avoid it at all costs (cf. Reed & Knaapila, 2010), making the buttermilk treatment a classic example of individualized nursing care. To be effective and cost-effective in improving health, however, individualization needs to go well beyond simply honoring preferences to appreciation of why preferences exist, and how and when they “work” when used as interventions.

Today’s precision medicine initiatives extend the individualization long valued in nursing to the broader realm of healthcare. Enabled by new insights from the fast-developing omics sciences, precision healthcare aims to tailor prevention and treatment efforts to the array of unique characteristics that make up an individual (www.whitehouse.gov/precision-medicine). In 2003, the announcement that the human genome had been completely sequenced signaled the start of a new era in the life sciences. Genomics exploded as additional subfields—transcriptomics, proteomics, metabolomics, exposomics, microbiomics, epigenomics—emerged and collectively became known as omics. At first blush, introduction of this new and somewhat unfamiliar sounding terminology into the nursing science lexicon suggests an “addition” to current perspectives or implies that viewpoints that have served the discipline well will need to be “set aside.” Neither is the case. Advances in omics are creating the circumstances needed to fully incorporate biology with psychosocial and behavioral aspects of nursing science to create an in-depth, multiscale, dynamic understanding of health and illness. Arising from integrated knowledge documenting biological and psychosocial-behavioral links—from molecules within cells, to persons within society, over time—care optimized for the individual is envisioned across the range of health services: identification of at-risk individuals, screening and diagnosis, clarification of prognosis, optimization of drug therapy to maximize therapeutic benefit and minimize adverse outcomes (Genomic Nursing State of the Science Advisory Panel et al., 2013), among others.

Disorders compromising the health and wreaking havoc on the lives of people today are often thought of as single disorders like “type 2 diabetes,” “hypertension,” or “schizophrenia.” New knowledge about the molecular basis of health conditions is demonstrating the existence of a wide variety of subtypes with similar expression at the level of the person (phenotype) but different underlying pathology; the heterogeneity can be caused by genetic variation or by differences in environmental exposure (creating phenocopies). Symptom expression in response to health conditions is similarly heterogeneous, as is effectiveness of treatments, where what works well for the “average” person doesn’t necessarily work at all for others.

Manifestations of research and the knowledge discovery process are changing as omics are being made part of nursing science. Nursing scientists, nurses, patients, and the community at large are collaborating across all phases of research and translation of research findings. Laboratory-based investigations of basic science questions in nursing are becoming more familiar. Research questions are becoming more truly person-centered (idiographic). Sequential, multiple assignment, randomized trials (SMART), multiphase optimization strategies (MOST), and person-focused designs yet to be invented are revealing protocols for adaptive dosing of treatments for optimal results for individuals or small groups of individuals who share similar characteristics. Technology is enabling new methods of data capture and analysis to make sense of data on a large scale. Uptake of omics perspectives will (should) prompt renewed introspection about the meaning of holism and directions for the development of nursing theory that incorporates health-related phenomena across scales of being and over time. The cost involved in making change in these directions is worthwhile for the benefits they augur: individually optimized interventions for prevention of deleterious health conditions and treatment of health problems.

To ensure that individuals, families, communities, and populations benefit from nursing care informed by advances in omics, the next generation of practicing nurses and nursing scientists will need firm schooling in the foundations of these related sciences and their intersections with our discipline (Calzone et al., 2010; Genomic Nursing State of the Science Advisory Panel et al., 2013). The groundswell of appreciation for the close links between the omics sciences and nursing is prompting intense discussion (Conley & Daack-Hirsch, 2016) about how best to approach integrating omics into nursing science training programs—from prerequisites to course work to
faculty and institutional expertise and resources to structures for dissertation committees—to ensure that graduates are well prepared to ask important and relevant questions and launch successful competitive research careers that create new knowledge for practice (Conley et al., 2015; Henly et al., 2015).

Nurses first documented their value for personalization of care and belief in its effectiveness by writing nursing care plans based on individual assessment (Henderson, 1973; McCloskey, 1975). Today, in the omics environment, this tradition can be enriched by gaining deeper understanding of the origins of individual differences across the domain of health and illness phenomena and their implications for person-focused nursing interventions for optimizing health and preventing and treating illness.

REFERENCES


