



RESEARCH ARTICLE

Translational Research; From Bench to Bedside and Community–Brief Review.

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Abstract

Science does not flourish in vacuum. There is a connection between science and its application. Scientific discoveries need to be translated into practical applications in order to improve health and well-being of mankind. Many discoveries typically began at “the bench” with basic research in which scientists studied disease at a molecular or cellular level then progressed to the clinical level, or the patient's “bedside. It is important that basic research and applied research need to go hand in hand to provide complete answers for many research questions. Translational research in nursing is an emerging area of interest for many. Translational research conveys different meaning to different people, but it seems it is important to everyone. Hence this review is intended to highlight the concept of translational research, its need and applicability in the field of nursing.

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Introduction:-

Translational research has become an extremely popular buzzword in the world of biomedical research lately and was designed for the medical world. It emerged in response to concern over the long time lag between scientific discoveries and changes in treatments, practices, and health policies that incorporate the new discoveries(1).

Translational research is broader than the traditional term “applied research.” Applied research is any research that may possibly be useful for enhancing health or well-being. It does not necessarily have to have any effort connected with it to take the research to a practical level. For example, an applied research study might analyse longitudinal data that tracks participants’ health and social relationships. But in translational research, the same researchers would partner with a community and ask for ideas about how their findings might apply there. Together, they would come up with an intervention plan that would also include scientific evaluation of its effectiveness (2).

Definition:-

Research that translates scientific discoveries and advances from the bench or laboratory into a clinically germane application (1).

“Translational research in nursing is scientific investigations of methods, interventions and variables that influence adoption of evidenced based practice by individuals and organizations to improve clinical and organizational decision making in health care” (3).

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Need for translational Research:-**Knowledge - Practice Gap:-**

The 'knowledge driven model' was used within the medical field assumed that basic research would progress to applied research and would eventually lead to development stages, such as new medicine or technology and then application in the realm of practice. Example it took 200 years for convincing cure for scurvy (4).

Cultural Differences:-

Early knowledge-driven and problem solving models reduced interaction to one-way due to cultural and value differences between academicians and decision makers (4).

Research and Practice Gap:-

Expanding research literature being difficult to access in a timely fashion, gaps in the current understanding of health and disease processes, and the difficulty of interpreting the results of research publications, there remains also the tension of conjoining a knowledge base from a scientific research community with that of clinical communities (2).

Evidence Based Movement:-

Focused the two-way nature of knowledge flows and the need for active engagement, rather than passive diffusion. Rather than assessing knowledge flow solely by the efficiency of outcomes, the conceptual focus shifted on the process of interaction and collaboration. Also, while EBM reconciled the volitional variations involved in the problem selection and analysis around the logic of efficiency, the emerging conceptualizations of knowledge exchange considered and reconciled cultural differences in a symmetrical and reciprocal interaction of researchers and practitioners (5,6).

Emergence of the research translation Models:-

Emphasize interactions between researchers and decision-makers in developing and implementing research in practice (2).

Components of Translational Research:-

There are two areas of translation.

- Type One Translation (T1): It is the process of applying discoveries generated during research in the laboratory, and in preclinical studies, to the development of trials and studies in humans. Usually called "bench to bedside," (i.e., services, programs, practices and products etc.).
- Type two Translation (T2): this area concerns research aimed at enhancing the adoption of best practices in the community. Cost-effectiveness of prevention and treatment strategies is also an important part of translational science. (e.g., health care settings, community-based organizations, schools etc.) (2,5).

Translational Research - A Collaborative Approach:-

Enhancing team science to improve its ability to work across disciplines and professions is the major hallmark of 21st century science and is now commonly seen as the key for advancing translational research. Team science may make use of a range of modalities:

- ★ Multidisciplinary: Coordination of research among scientists of different backgrounds and disciplines.
- ★ Interdisciplinary: Cooperative effort of scientists on issues that fall between disciplinary boundaries.
- ★ Transdisciplinary: Collaborative projects where information exchange, the modification of scientific approaches, and the integration of scientists and approaches from different disciplines advances research toward a common scientific goal (7,8).

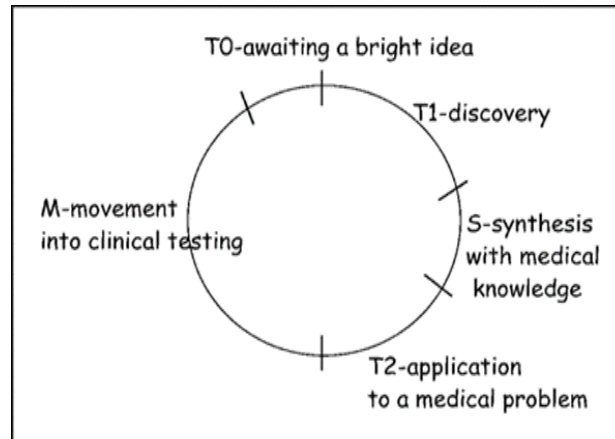
Translational Research Cycle:-

"Translational research cycle", includes several identifiable stages and clearly defined checkpoints. Each phase has its unique features. For example, the resting phase (T0) requires the generation of a great idea and the formulation of that idea into a testable hypothesis.

The testing phase (T1) is when the great idea is subjected to interrogation through scientific inquiry. This hypothesis testing requires the assembly of a research team that includes students, postdoctoral fellows, and more established scientists. The principal investigator or team leader must acquire funding for the project and show that progress is

being made. With a combination of luck, skill, and tenacity, a discovery will occur that may become the basis for translation.

The synthesis phase (S) requires the ability to identify the potential importance of a discovery to a clinical problem. This is often dependent on mechanisms to place fundamental information in front of people who understand the scientific basis of medicine and are familiar with medical problems.



Movement into the application phase (T2) requires the ability of researchers to determine the importance of a discovery to human biology. Here, the team of investigators must have access to human tissue and body fluids, predictive animal models, as well as pathologists, pharmacologists, surgeons, and biostatisticians.

The movement phase (M) is where preclinical studies enter the clinic. Now the research team must expand to include practicing physicians, nurses, research coordinators, toxicologists, informaticians, regulatory experts, lawyers, and a variety of other seemingly unrelated species. Ironically, as the discovery moves closer to human application, the science tends to get less sophisticated, yet the funding gets more difficult (9).

Translational Research in Nursing:-

In recent decades, the initiatives to develop individual, collaborative, or multicentric nursing research have multiplied throughout the world. The objective of such initiative has been to improve the quality of nursing care given, offering greater security to patients and influencing more effective health care policies. Research based on evidence, clinical research, systematic literature reviews, convergent care research, phenomenological studies, and social representations all share the same objective: to respond to professional practice questions. However, despite all the knowledge such efforts have produced, there is a vacuum among the studies and the use of the results from research carried out in public or hospital health care services. Translational research, with its mantra "bench to bedside and back," emerged as a top priority in the field of nursing has arisen in an attempt to fill in the vacuum and approximate the researcher to fields of practice (10).

Clinical and translational Research Center Nursing: nurses skilfully combine both the clinical and research aspects of patient care. With patient safety a priority, maintaining the highest standards of research conduct, utilizing expert clinical judgment, critical judgment, critical thinking skills, and a patient-centred approach are the key components which are emphasised (8).

Nursing Leadership in Translational Research:-

Nurses should assume leadership for the majority of translational science projects in hospitals. Nurses need to identify optimal mechanisms for enriching the care provided in the more remote communities. Also, nursing has had long-established historical efforts at studying broad range outcomes in health care, which positions them very well to lead, including establishing institutes focusing on translation within hospitals and health systems. Nursing homes and other long term care services and home care should be very high on the priority list. Given nursing's commitments to address health disparities, they must assume more leadership responsibilities for translational research that illuminates how the communities at greatest risk can benefit from the very expensive work they are all doing. It is not good enough to continue to generate studies that show how one can change health and health care in

communities that have access to high quality health care as well as adequate housing, nutritionally adequate diets, and good health education. Nurses should be devoting more of their efforts to the census tracts in inner city and rural areas (4).

Future of Translational Research in Nursing:-

Nurses must engage immediately and assertively in setting an agenda for translation of their research to practice in health care systems and to public. In order to achieve this, nurses need to focus on three sectors: traditional, mainstream health services including complementary and alternative health services and community health services, and the general public.

- ✦ Nurses must be visible and vocal on focusing on the areas in which nurses have expertise. Nurses should expect that they exist to embrace, advance, and translate nursing science, given that nurses have been contributing to clinical sciences
- ✦ Nurses should make their translational science models visible, and their efforts should be supported by federal agencies.
- ✦ Contemporary communication Medias have a great reach and nurses should use them more effectively to promote health and health-care. Nurses need to author articles and books for the public and contribute to internet sources designed to translate research findings to the public for their benefit.
- ✦ If nurses are truly committed to translation of research in practice, they will resolve to educate clinicians who are capable of the translational work necessary to truly achieve this goal (11).

Conclusion:-

Although the science of translating research into practice is fairly new, there is some guiding evidence of what implementation interventions to use in promoting patient safety practices. However, there is no magic bullet for translating what is known from research into practice. To move evidence-based interventions into practice, several strategies may be needed. Nurse scientists must reevaluate how proposed research fits within and contributes not only to the development of new knowledge, but to the translation of that knowledge to the care of diverse communities and populations.

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