

Translational research: Current status, challenges and future strategies in Nepal

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Cite this article as: Parajuli SB, Bhattarai P, KC Heera. Translational research: Current status, challenges and future strategies in Nepal. Nepalese Heart Journal 2018; 15(2): 3-7.

Received date: 13th August 2018

Accepted date: 13th October 2018

Abstract

The concept of translational research is emerging around the globe. The practice of clinical care, health promotion and health care delivery system need to be evidence based. Translational research is the utmost solution to generate evidence and implement the scientific findings. Now the time has come to conduct translational research in Nepal to generate our own evidence and to integrate it into the policy of new federal health system. The objective of this review article was to identify status, challenges and future strategies of translational research in Nepal.

Keywords: Nepal, Paradigm shift, Policies, Strategies, Translational research

DOI: <http://dx.doi.org/10.3126/njh.v15i2.21469>

Introduction

Translational research is an advanced separate emerging research field. Despite tremendous development in the field of medicine, current research work is unable to justify effective medicine and healthcare against various diseases.¹ Several millions of immature deaths occur every year globally due to lack of effective medicine and healthcare.² In terms of Quality adjusted life year (QALY), the global burden of disease is increasing day by day.³ Hence, time has come to start thinking on implementation science and to promote translational research in order to improve the quality of life. In the context of Nepal new federal healthcare system, the translational research is of utmost importance.

Objective

The objective of this review article was to identify status, challenges and future strategies of translational research in Nepal.

Methods

Search strategy

For the purpose of literature review, different search strategies were performed. The databases searched for last 25 years from 1993 to 2018. We used combinations of medical subject headings (MESH) and free text words. Key words used for literature search were “translational research”, “implementation science”, “evidence based medicine”, “global burden of diseases”, “translational research and Nepal”, “Implementation science and Nepal”, “evidence based medicine and Nepal” and “cardiovascular diseases and Nepal and translational research”. Searched articles having english language were selected. The reference lists of identified articles were assessed. PubMed, Google Scholar, NepJoL and Google were used to search the articles. We identified articles eligible for further review by performing an initial screen of identified titles or abstracts, followed by a full-text review. Only relevant articles as per objective of this review article has been taken. The search strategy used in the review process shown in figure 1.

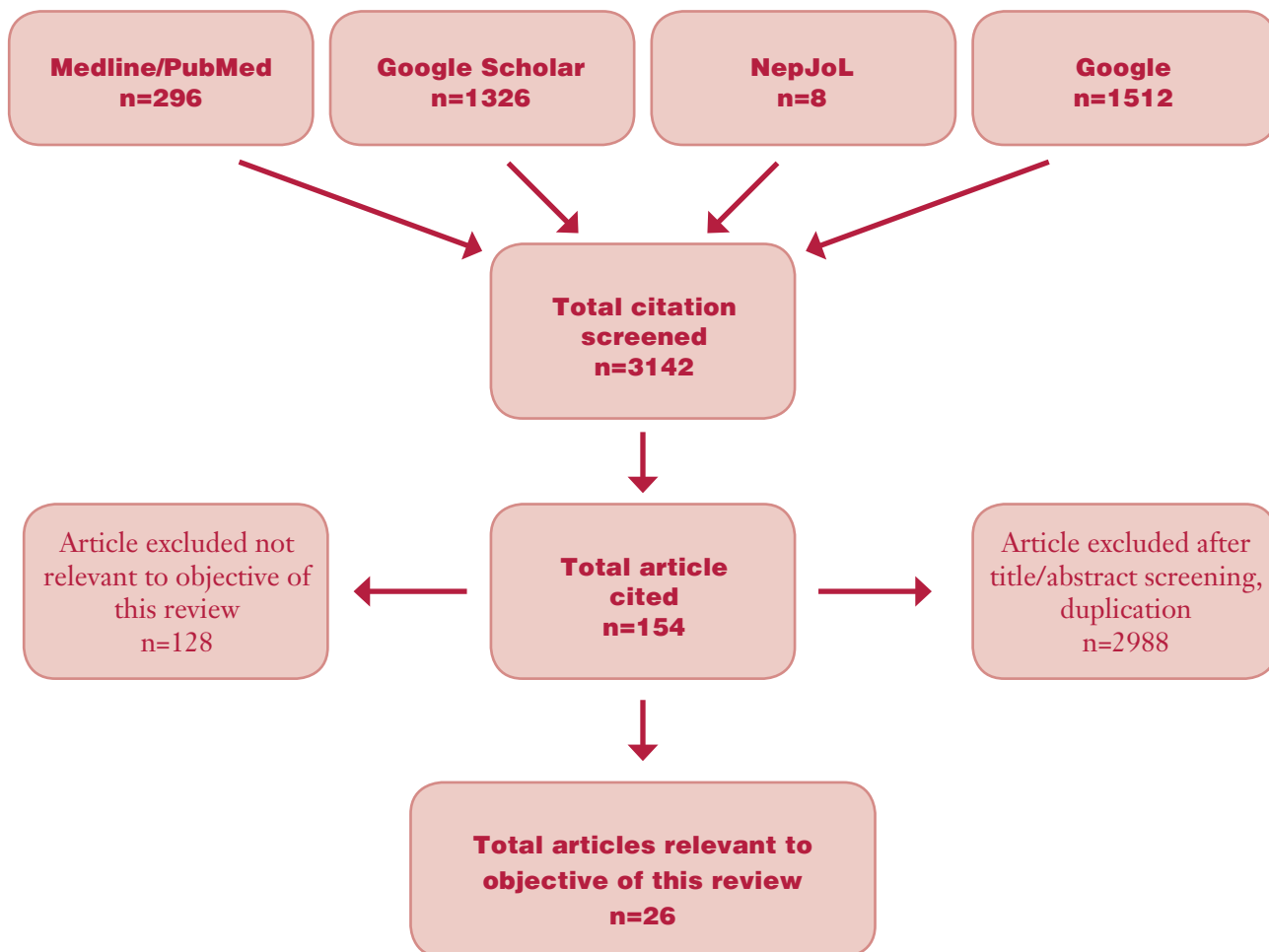


Figure 1: Flow diagram showing article search strategies

Results and Discussion

According to University of California, “Translational research is the process of applying knowledge from basic biology and clinical trials to techniques and tools that address critical medical needs. Translational research will improve the health outcome which uses integrated group of experts focused on useful information from lab to doctors and hospital policy.”⁴ The term “translational research” first appeared in PubMed in 1993. There is not a clear cut definition of translational research and thus we will get different responses if asked with different experts.⁵ This is relatively a new discipline that merges aspects of both basic science and clinical research, which requires skills and resources which are not readily available in a basic laboratory research or clinical setting alone. Dedicated academia or dedicated research organisations can only work for effective translational research.^{6,7} One study estimated that it requires 17 years for only 14% of new scientific discoveries to become incorporated into standard practice.⁸ The translational science spectrum is shown in figure 2.

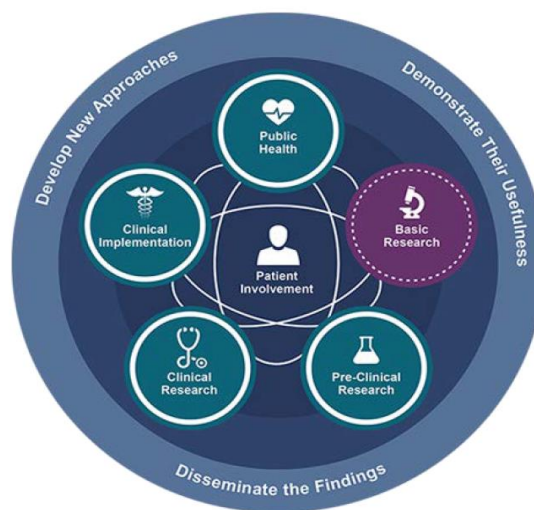


Figure 2 : Translational Science Spectrum⁹

According to Woolf SH, “researches have different views on the stages of translational research. There are 2 stage model (T1 and T2), 4 stage model (T1, T2, T3, and T4), and 5 stage model (T1, T2, T3, T4, and T5).¹⁰ In two-stage model, T1 research refers to the bench to bedside meaning translating knowledge from the basic sciences into the development of new intervention and T2 research reflects translating the findings from clinical trials into day by day practice.”¹⁰ The five-stage model, T1 is basic research followed by T2 which involves preclinical research, T3 deals clinical research, T4 involves clinical implementation, and

T5 is the implementation in the greater public health scenario.¹⁰ Effective translation from clinical studies to widespread clinical practice will achieve only part of the goal of improved health of the entire population. There exist a gap between clinical practice and population-wide health which is rarely discussed in the translational research field.¹¹ In addition, factors contributing to the health of the population stretch far beyond traditional health care and include social, financial, community, behavioral, educational, and cultural domains.¹²

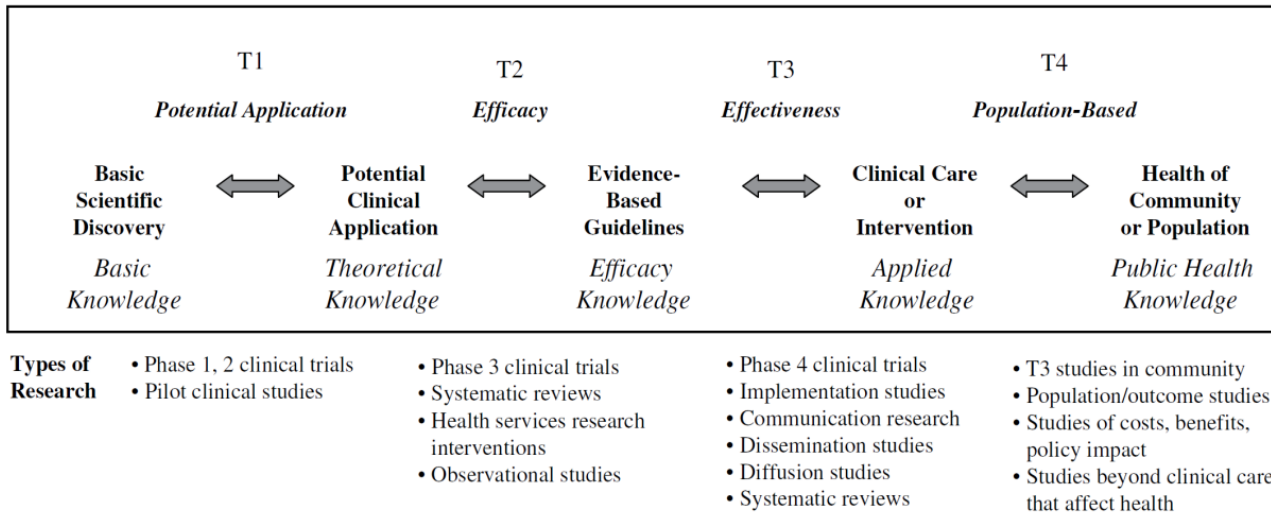


Figure 3 : Phases of translational research¹³

The growing need of translational research

The CTSA (Clinical and translational science awards) initiative provides infrastructure support to assist academic institutions to more effectively train the next generation of clinical and translational researchers, promote multidisciplinary research teams that link basic and clinical domains, design and test novel clinical research, support local communities and vulnerable populations, and develop private and public partnerships.¹⁴ Translational research has gained much acceptance over the past few years because of its wider coverage from close laboratory to real life situations on the basis of vigorous studies and scientific facts. On one hand, this approach promises great scientific and clinical advances, at the same time it has its critiques and some ethical challenges of prioritizing scientific projects based upon their potential for translations; financial connections between sponsors, scientists and clinical investigators; and sometimes involving research evidences of little experience determining patients’ safety.¹⁵ In 2003, the National Institutes of Health (NIH) had issued a strong challenge to change the way of scientific work so that the researchers and donor communities have started responding it. Private foundations can act more quickly than large public or academic institutions. For example, the Bill and Melinda Gates Foundation (Seattle, WA) highlights the grand challenges in Global Health Initiative, “a major effort to achieve scientific breakthroughs against diseases that kill millions of people each year in the world’s poorest countries”. They are also contributing for translational research.¹⁵ Despite this lack of clarity, huge NIH programs, such as CTSA, medical school units, and new medical journals, have all been created that are dedicated to translational research. In fact, translational research may have received more attention and more resources than any other entity without exact definition in the history of medicine.⁵

Implementation of translational research

There are four critical implementation issues for translational research to become effective. The first issue is matchmaking. This is one of the most important obstacles to advance the translational research in an extreme administrative and geographical complexities of the academic research environments. Compartmentalization in distinct schools, institutes, centers and programs often presents significant physical and cultural barriers including undervaluing project-oriented translational research.¹⁶ The second issue is metrics. Clearly the endpoint of translational research is new and effective products for the diagnosis, prevention and treatment of disease. While many new therapies are derived from ideas originating in university and research institute settings, is it appropriate to use “cures” as a measure? Many in the academic community resist such a metric because much remains to be learned about.¹⁶ The third issue is money. The academic institutions uses a small fraction of the massive financial influx to build and expand translational research infrastructure successful.^{16,17} The fourth issue is political commitment. The formulation of a compelling national vision for translational research funding bears a substantial analytical and political challenges that the academic community is not currently prepared to confront.¹⁶

Current status and challenges of translational research in Nepal

The concept of translational research is new in Nepal. Research articles published in Nepal are basically focused on initial steps of translational research process as basic research (T1), preclinical research (T2) and clinical research (T3).

The clinical implementation (T4) and implementation in the public health scenario (T5) are not adequately studied.^{18,19} The problem of inadequate investment from the government and research institutions for translational research halts the progress of translational research culture in Nepal. The lack of multidisciplinary, multicentric research culture is another challenge. There is huge know do gap in Nepal. The policymakers have challenges to translate the research findings into policies and practices. This gap has always threatened the effective implementation of policy. Currently, some of the evidence-based research articles have been published in Nepal however, its effective utilisation at the implementation level is still an immense challenge.¹⁹

One of the upcoming issue of translational research is on cardiovascular health. Due to epidemiological transition, non-communicable diseases (NCD) are the growing public health issue of Nepal and cardiovascular diseases (CVD) are the major contributors.²⁰ Risk factors for CVDs have increased alarmingly over the past decades.²⁰ Although there are proven measures for prevention and appropriate management of CVD, the challenges for implementation still remains.²¹ Gaps in epidemiological understanding of CVD and its risk factors, lack of policies and strategies at national level, incompetent human resources and health system infrastructures for health promotion, education and treatment, and lack of community and patient support at local level are major challenges that limit implications of known interventions of CVDs even when they are developed.⁷ NepJOL is a database of journals published in Nepal, covering the full range of academic disciplines. NepJOL was initiated in June 2006 and officially launched in September 2007. It is now managed by the Tribhuvan University Central Library, Kathmandu, Nepal.¹⁹ It is a project supported by the International Network for the Availability of Scientific Publications (INASP). It aims to promote the awareness and use of Nepal-published journals in all disciplines by providing access to tables of contents (TOCs), abstracts and full text on internet. Currently among listed health journals from various fields none have direct publications as translational research journal.¹⁹ It is high time to initiate translational research journal in Nepal.

Cardiovascular diseases translational research new initiative in Nepal

In the field of cardiovascular diseases, Dhulikhel Hospital Kathmandu University Hospital initiated a leading work to create a multi-sectorial, multidisciplinary collaborative team to develop translational research capacity building initiatives to prevent and manage CVDs in Nepal. The project is aimed to develop a critical mass of human resources in Nepal, collaborating with national and international partners, to conduct translational research in CVDs.²¹ This project will identify prioritized needs and a well-defined translational research plan to address one or more major CVD risk factors and outcomes. This project has started the training on “translational research capacity building initiative to address cardiovascular diseases in Nepal” under the grant of National Institute of Health (NIH) Agency: National Heart, Lung and Blood Institute (NHLBI) as a resource related research projects-cooperative agreements (U24), project 1U24HL136789-01 from 1st September 2017 till 31st may 2021.²¹ The design of an effective training program in translational research is a challenge because the program must offer each of its trainees the opportunity to master a combination of skills in addition to traditional training programs.²² The approach to evaluating the success of translational training programs must be flexible enough to accommodate the needs of individual institutions and individual trainees within the institutions, but it must also be rigorous enough to document

that the program is meeting its short, intermediate, and long term objectives and that its trainees are meeting pre-established competency requirements.²²

Future strategies and ways forward for translational research in Nepal

After the promulgation of new constitution of Nepal, there are three level of governance viz. central, provincial and local. Local government has got the mandate to develop their own health policy. The new policy should have translational research component in clinical care, health promotion and health care delivery system. They should emphasize the translational research work for local evidence generation, which would be helpful to make effective policy and its implementation. Research based evidence work in the policy will help to promote the United Nations sustainable development goal. Central, provincial and local government should think on the concept of translational research work. Use of local resource, work force and the skills would be more valuable for the successful start of translational research in Nepal. The collaboration between the government, academia and policymaker is the need of today's society.

Conclusions

The current status of translational research work is in preliminary stage in Nepal. It has many challenges and obstacles but time has come to initiate translational research in Nepal. This will help to achieve health related sustainable goals in better way.

Conflict of interest

The authors do not have any conflict of interest including financial in publication of this article.

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