# Knowledge Translation for Diabetes Mellitus Research and Management in Nepal

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**ABSTRACT**

Knowledge Translation is an integral arena in public health and healthcare research, which is increasingly used recently. It is the process of abetting knowledge that is erudite via research into different settings; including clinical and policymaking. As well, it helps to use research into practical setting. The efficient knowledge translation enlists all level of health care system as families, patients, physicians, policy makers, private healthcare organizations, and relevant stakeholders to accelerate the benefits of research through improved health, more effective services and products, and strengthen the health care system. Knowledge Translation plays a vital role to fulfill the gaps between research facts and real practices; through KT process, clinicians, decision makers, and services providers can improve the quality, efficacy, efficiency, and effectiveness of healthcare services. Management of Diabetes is very essential in healthcare, where information gaps are known to be existing. Nepal is one of the low-income countries, where communicable diseases are still the public health issues as well as the burden of non-communicable diseases are also in increasing trend. In recent years, the prevalence of diabetes in Nepal has been increasing, which is leading to premature deaths. The increasing risk of diabetes in the country can be controlled by the effort from knowledge users, or all stakeholder that needs strategic knowledge translation and implementation plan. This article comprises outline of Knowledge Translation, importance of KT in diabetes management in Nepal, and steps for knowledge to action framework.

*Keywords:* Knowledge Translation, Diabetes mellitus, Research and Management

**Knowledge Translation**

Knowledge translation (KT) is crucial and increasingly used in healthcare research. It is abetting knowledge that is erudite via research into different settings including clinical and policymaking. [1] The concept of Knowledge translation is broader, that includes knowledge dissemination, communication, transfer of technology, ethical context, knowledge management, technology assessment, knowledge utilization, implementation research, synthesis of result within global context, development of guideline, and more, which are applied for beneficial outcome of the society. [2] The Canadian Institute of Health Research (CIHR) adopted the concept in 2000. CIHR defined Knowledge Translation as "a dynamic and iterative process that includes the synthesis, dissemination, exchange, and ethically sound application of knowledge to improve the health of Canadians and provide more effective health services and products and strengthen the healthcare system" (CHIR 2009). This definition has been adopted by many notorious organizations, including the United States National Center for Dissemination of Disability Research (NCDDR) and the World Health

Organization (WHO). The CHIR has four elements of Knowledge Translation, as described here;

Synthesis: "The conceptualization and integration of research findings of individuals research studies within the larger body of knowledge on the topic."

Dissemination: "Identifying the appropriate audience and tailoring the message and medium to the audience."

Exchange of knowledge: "The interaction between the knowledge user and the researcher, resulting in mutual learning."

Ethically sound application of knowledge: "Activities for improved health that is consistent with ethical principles and norms, social values, as well as legal and other regulatory frameworks." [2]

**Importance of Knowledge Translation**

There was unavoidable delay in the application of knowledge into practice with the latest medical advances and getting right information by time for appropriate treatment were the critical issues. Due to the failure to use consistent evidence from research findings in the healthcare planning and delivery leading into erroneous decision making and formation of care gaps among health professional, all group of decision makers, patient, managers, informal care givers, and policy makers. [3] Some of the examples are 30-45% of the patients do not get treatments of proven effectiveness. Children with upper respiratory tract symptoms are overprescribed with Antibiotics. [4,5] One of the researches conducted in US revealed that even though billion of dollar spent in private and public sectors in health and medicine on education and research, the health care system has unsuccessful to provide cost effective treatment to those who are in need. For instance, around 20-30% of patients get care that is not needed, or potentially harmful [5,6] From above consequences, it is elucidating that practice gaps, patients are not getting any beneficial in optimal level from healthcare, which leads into lower quality of life as well as loss of productive life. Similarly, this also concluded that patients

are exposed to unnecessary harmful risks as well as there is continuous economic burden in healthcare industry due to unnecessary expenditure. [6]

Over the last decades, the international policy makers and researchers are aware of diminish the evidence-practice and policy gaps. That is why knowledge translation has been drastically increased. [7] Proper execution of research knowledge, or the application of knowledge translation into healthcare industry including patients, doctors, hospital managers, policy makers, and all stakeholders are aware of all available health care options and its risk-benefit, so that they can take a bold decision. [8] World Health Organization (WHO) accepted the concept of knowledge translation in the year 2005, which has major role for enhancing knowledge translation and bridging the know-do gaps. WHO define Knowledge Translation as "KT is the exchange, synthesis, and ethically sound application of knowledge within the complex set of interactions among knowledge producers and relevant stakeholders to accelerate the benefits of research through more effective services and products and a strengthen the health care system in improving people's health" (WHO). [9,10]

**Knowledge Translation in Diabetic Mellitus**

Diabetes is one of the top 10 leading causes of death globally. According to International Diabetic Foundation (IDF), approximately 415 million people living with diabetes worldwide and predicted to rise to 640 million by 2040. In 2017, diabetes accounted for about 4 million deaths worldwide with an estimated costing USD 19 billion to the economy. [11] Similarly, the prevalence of diabetes is increasing in South East Asian countries; 82 million people have diabetes in the region. The number is predicted to be risen by 151 million by the year 2045. Nepal is one of the low-income countries, where communicable diseases are still the public health issues as well as the burden of non communicable

diseases are also in increasing trend. According to IDF SEA Region (2017), 679,200 cases of diabetes were reported in Nepal. [12,13] The risk factors associated with diabetes including lifestyle; sedentary lifestyle, diet, smoking, alcohol consumption as well in some cases genetic risk factors are also connected. [14] Additionally, lack of diabetes education as well as poor self care practices lead into poor glycemic control and complications like diabetic neuropathy, diabetic retinopathy, diabetic nephropathy, and so on. [15] The changes in lifestyle, consumption of food like high carbohydrate, salt, sugar, and oil are sources of obesity and thus leading to diabetes as an epidemic in Nepal. [16] WHO estimated that by the year 2030, prevalence of diabetes in Nepal will be risen by more than 3 times that is greater than projected 2.5 times rise prevalence of diabetes in India. [17]

Diabetics can lead to premature death. Mismanagement of diabetes results in numerous health problems such as stroke, heart problems, blindness, kidney issues, nerve damage, leg as well as foot amputation, and eventually death. Minor alteration in daily lifestyle and dietary intake can greatly reduce the chances of the disease. Additionally, regular health check-up and proper examination, change in lifestyle, choice of healthy food, enhance and promote regular physical exercise including walking are some of the strategies to prevent the diabetes, that are fruitful for human health. The healthcare providers and patients should understand and follow the basic dietary needs of the patients. [18] It is very important to mobilize the knowledge about dietary pattern and lifestyle changes to overcome diabetes among people, physician, and policy makers. Nepalese people aspiring to be aware of the consequences of diabetes and inspire to implement healthier lifestyle choices. Likewise, most of the researches have stated that knowledge and awareness about diabetes among Nepalese are poor. [19,20] One of the studies conducted among diabetes patients revealed that knowledge attitude and practice level is low. [21]

In 1990, The Nepal Diabetes Association (NDA) was established with the objectives of prevention and management of Diabetes and its complications in Nepal. NDA has been more focused on education and advocacy; conducting education campaigns and advocacy among general population, diabetes patients and their families, and other health professional, stakeholders, and policy makers. [22] Due to the different socioeconomic and geographical population group, diabetic services are not access equally to all Nepalese people. Similarly, there is also lack of awareness of diabetes and its complication among general people. The services related to diabetes are delivered by public and private sectors. That is why the diabetes care services and quality of care are not uniform and organized throughout the country. The service providers are practicing different guidelines as there is not National Guideline for diabetic care in country. [23] There is an immediate need for physicians and policymaker to develop a comprehensive plan and guideline to be followed to provide uniform healthcare services and overcome diabetes. The increasing risk of diabetes in the country can be controlled by the effort from knowledge users and all stakeholders that need strategic knowledge translation and implemented plan.

## Knowledge-to-Action Framework

Depending upon the target population and type of knowledge to be transferred, knowledge translation strategy is diverse. The Knowledge-to-Action Framework was developed by Ian Graham and et al, which is adopted by Canadian Institute of Health Research (CIHR) as well as other organizations worldwide for guiding the Knowledge Translation process. The process of knowledge translation into action is iterative, dynamic, and complex. It is composed of two distinct components; 1) Knowledge Creation and 2) Action cycle. Knowledge Creation is the first component

in the model which is represented by funnel. The knowledge is purified as it passes through each stage leading to the knowledge to be more useful to the end-users. [24] There are 3 phases of Knowledge Creation:
1) Knowledge inquiry (for instance: primary research)
2) Knowledge synthesis (e.g. systematic review, scoping review, meta-analysis)
3) Creation of knowledge tool and product (e.g. decision-making tool, practice guidelines)
Action cycle: The action cycle comprises series of activities required for application of knowledge /knowledge implementation. The steps are as follows:

**First step:** Identify problem/ Identify and select the knowledge
The first and foremost step in action cycle is to identify the issue or the problems of the population that needs to be addressed. Generally, researcher has an abundant amount of knowledge. All knowledge does not need to be translated to the audience, depending upon the need and demand; only important information should be delivered. The copious amount of information for specific audience conceal the right message that is why it needs to be filtered in such a way that most prominent points are convey which should be in detail as well as need of the target audiences. [25]

**Second step:** Adapt Knowledge to the Local Context
It is a critical step and consider as fit of knowledge with the target audience. The statements should be clear, concise, audience-targeted, and required to understanding in the local context and implication in such a way that recommendation made should be relevant and feasible to the target audience. For instance, we need to be careful if we are introducing a guideline which may not be fit to the local setting, or it may need unavailable material, resources as well as equipment. In such context, we ought to modify the guideline based on the evidence. [26] To reduce the risk of increasing diabetes mellitus in Nepal, the approach should be targeting all users such as healthcare practitioners, diabetic patients, policy makers, general population, media, and advocacy groups.

Moreover, the information provided need to be specified depending upon the target audience, for example health practitioners versus policy makers and so on. The appropriate level of language needs to be used for various audiences. For example, the terminology "diabetes" may be unclear to the general public, patients, or policymakers. [25]

**Box 1: Different types of message depends upon various target audience.**

For health care providers:
- Provide education to the patient about prevention and treatment of disease
- Encourage patient to follow health diet chart and lifestyle
- Adopt and follow clinic practice and guidelines
- Practice appropriate referrals and consultation

For the patients and general public:
- Eating healthy and balance diet
- Increasing physical activity and reduce obesity as well as maintain healthy weight
- Consult with your doctor if you are at high risk for developing diabetes
- Reduce stress

For Policymakers:
- Diabetes services should be available and accessible
- Enforce nationwide robust programme for prevention of diabetes
- Allocate financial schemes for diabetes care
- Develop and implement the national guidelines

**Step three:** Assess barrier to knowledge use
It is very essential to assess the complications of the target audience by identifying the hindering factors or help them to use knowledge before any intervention. The possible factors might be issue regarding knowledge itself, who will be using knowledge as well as the setting where knowledge is to be used. [25,26] Barrier and facilitators can be identified by different

methods like conducting surveys, focus group discussion, interviews, observation, and review of records.

**Step four:** Select, Tailor, and implement intervention

After recognizing the possible barriers, the next step is to disseminate and transfer strategy that is all about planning and performing intervention to promote awareness and knowledge use. The application of knowledge translation strategy depends on the well-defined goal or objective for each strategy. In general, multiple strategies may lead to the better impact than single strategy if the available resources are liable. Dissemination strategies such as conferences, publishing articles, presentations, workshops, webinar deliver education for Nepalese people about seriousness of diabetes mellitus as well as the roles of healthy diet, exercise, self-care management, and regular health check-up in the prevention of this disease. Additionally, social media has provided a means of communication quickly and efficiently at minimal cost in short time. Engage opinion leaders to promote the change and well-known organization in related area can promote the changes. They can advocate the policymakers to develop the national guideline and revise the food regulation. Regular reminder needs to be sent to the health practitioners to endorse proper diagnosis, treatment, and referral for diabetes care, and motivate and counsel the patient to accept the healthier lifestyle. [24,27]
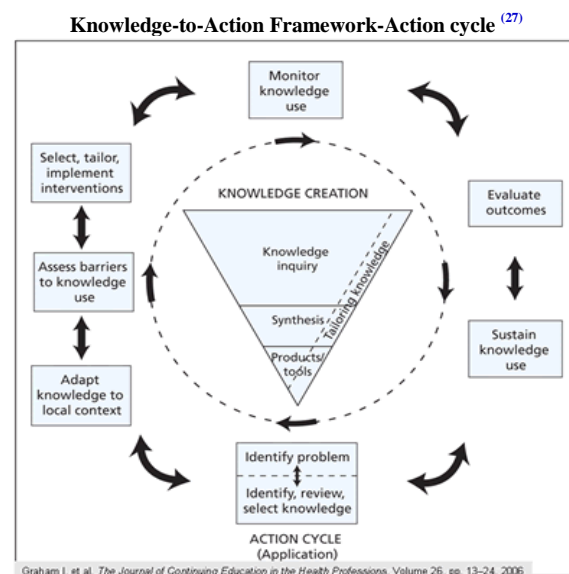
**Step five:** Monitor knowledge use

Once the knowledge translation intervention has been implemented, it is very most important to measure if outcomes are being achieved (intended or unintended). Knowledge uses can be monitored through different procedures, depending upon who the target population are? For instance, when assessing knowledge uses by the public, surveyor focus group discussion can be conducted among diabetic patients to measure the attitude. Furthermore, knowledge uses can be monitored through social media via public's response including comments, messages, likes, and shares. Clinical database or an administrative database can be used to monitor the knowledge use among physician by tracking the prescribed medicine. [28]

**Step six:** Evaluate the outcome and Sustain knowledge use

The next step in action cycle is to determine if the implemented program was effective typically focus on health, provider, or system level. It is very essential to determine if the knowledge intervention would sustain. [28] Sustain knowledge use require enduring feedback because ongoing use of knowledge possibly be varying from the present barrier from time of intervention. Depending upon the feedback gained during each phase, positive feedback might reveal that the implemented strategy is effective. On the other hand, the acquired negative feedback needs to be reviewed to be implemented. In the case of diabetes, the outcome should be reduced the risks of diabetic. [25,27]

**Knowledge-to-Action Framework-Action cycle** [27]



Graham I, et al. *The Journal of Continuing Education in the Health Professions*, Volume 26, pp. 13–24. 2006.

**Knowledge Translation Program**

Diabetic Action Canada, a non profit research organization is a Strategic Patient Oriented Research (SPOR) Network funded by "the Canadian Institute of Health Research" (CIHR) was launched in 2016 comprising skilled researchers, patient partners, diabetes specialist, primary care practitioners, nurses, pharmacists, data

specialists, and health policy experts dedicated to improving the lives of person living with diabetes. Its aim is to transform the outcome of health of patient living with diabetes and addressing disparities in diabetes care. Diabetes Action Canada empowers the respectful communication with the researchers to find out the best solution for the most concern health issues that are recognised by patients and to mitigate mortality, morbidity, and suffering, the team bridges the knowledge translation gaps with the perception of patients, their caregivers, and healthcare providers to improve diabetes and its complications. [29,30,31]

## CONCLUSION

The several findings revealed that diabetes is becoming a serious public health issue in Nepal. The awareness about disease among the population is low, socio-economic factors, educational strategy, inadequate detection, prevention, and management program of the disease and its complication has been publicized. That is why, treatment and management of diabetes is burden in Nepal. [32] There might have a gap between the evidence and the practice, as there is not any National Guideline for diabetes care in Nepal. At present situation, the major gaps are insufficient number of trained diabetes physicians in the primary healthcare centres and district hospitals as well as there is lack of diabetes team comprising physician, dietician, nurses, and counselor in zonal and tertiary level hospitals and the laboratory services are not enough and accessible in every region. Furthermore, Diabetes is not still in the precedence expenses of budget by Ministry of Health as well. Nevertheless, in the absence of applied research finding into practice and sharing it into accessible form, it is meaningless. The Nepalese people should be aware of diabetes issues and its complications and need to practice healthy lifestyle and self help and go for regular health check-up. In nutshell, to raise awareness of the diabetes issues among

people, update guideline and clinical practice, and implement improved population health, the nation should have a strategic knowledge translation planin collaboration with various stakeholders, including clinicians, researchers, decision makers, policy makers, and opinion leaders.

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