August 2020

Knowledge Translation in Universities: An Experience from Iran

Seyedeh Zahra Mirezati
Hamadan University of Medical Sciences, z.mirezati69@gmail.com

Hossein Vakilimofrad
Hamadan University of Medical Sciences, vakili_hn@yahoo.com

Mohammad Karim Saberi
Hamadan University of Medical Sciences, mohamadsaberi@gmail.com

Knowledge Translation in Universities: An Experience from Iran

Seyedeh Zahra Mirezati

MSc, Department of Medical Library and Information Sciences, School of Paramedicine, Hamadan University of Medical Sciences, Hamadan, Iran
E-mail: z.mirezati69@gmail.com

Hossein VakiliMofrad

Assistant Professor, Department of Medical Library and Information Sciences, School of Paramedicine, Hamadan University of Medical Sciences, Hamadan, Iran
Corresponding Author: Vakili_hn@yahoo.com

Mohammad Karim Saberi

Assistant Professor, Department of Medical Library and Information Sciences, School of Paramedicine, Hamadan University of Medical Sciences, Hamadan, Iran
E-mail: mohamadsaberi@gmail.com

Abstract

Background: Knowledge translation meaning all processes of knowledge creation, knowledge transfer, and decision -makers' use of research results, the gap between knowledge and its use is a challenge that knowledge translators can address.

Objectives: The present study aimed to investigate the status of knowledge translation among faculty members of Hamadan University of Medical Sciences, Iran.

Methods: In this survey study, a structured questionnaire was used. The study population consisted of 457 faculty members of Hamadan University of Medical Sciences, Iran. Using Krejcie and Morgan table, 208 individuals were selected as the sample. Data were analyzed by Stata software at the significant level of 0.05. Independent t-test and one-way variance analysis were used for investigating the relationship between demographic variables and knowledge translation variables including knowledge creation, knowledge transfer, research utilization and Research question transfer.

Results: The results showed that the interest was the top priority of faculty members in selecting the research subject. Among the four domains of knowledge translation activities, knowledge transfer had the highest score and knowledge production had the lowest score. Results of statistical tests showed that there is significant relationship between knowledge production score and gender (P = 0.004), knowledge transfer score and gender (P = 0.024), and education level (P <0.001), score of evidence use promotion and gender (P = 0.001) and level of education (P = 0.04). In addition, the findings showed that the status of knowledge translation in Hamadan University of Medical Sciences, Iran is relatively favorable. The pursuit of encouraging work and policies as well as increased collaboration among expert groups to transfer research findings can reduce the gap between knowledge and practice.

Contributions: The results of this study as an Iranian experience can be a model for evaluating the use of research knowledge for other universities.

Keywords: Knowledge Translation, Faculty Members, Knowledge Cycle, Iran

Introduction

Today's care system around the world faces the challenge of how to effectively bridge the gap between what we know and what we do. This gap is called knowledge transfer gap, and knowledge translation is a possible response to this challenge (Hosseini, Ahmadi, Sadeghi, Mirbaha, & Safarizadeh, 2015). One of the characteristics of knowledge is that it grows through dissemination and exchange, leading to the creation of new knowledge. Given the costs that organizations incur to produce knowledge, optimal utilization of these products is of paramount importance (Sadighi & Majdzadeh, 2008). Knowledge from research is produced by researchers and may be used by individuals, organizations, or systems (Huber, 2001; Majdzadeh, Sadighi, Nejat, Mahani, & Gholami, 2008).

In the process of knowledge transfer, the role of knowledge-producing organizations is of great importance. In the meantime, universities have become increasingly regarded as the most important centers of science production. Traditionally universities have been the place of science. For playing an important role in economics, today it is planned that not only new knowledge will be produced in universities, but also that knowledge produced by universities will be transferred to the community and move the industry more forcefully (Pournaghi R, 2014). One of the most important parts of knowledge transfer from universities and research centers to users is translating research findings into the language of audiences, stakeholders, and users (Pournaghi & Nemati-Anaraki, 2015). In fact, knowledge translation is a process that explains the interaction between researchers and users in different sectors, from selecting a research subject to publishing it in a way that makes it possible to exploit more knowledge (Hosseini et al., 2015).

Although scientific publications in the field of medical sciences in the Middle East have grown significantly in recent years (Moin, Mahmoudi, & Rezaei, 2005), it should be noted that many researches are carried out annually results of which are not adequately utilized. Moreover, at different levels of decision-making, from clinical exports to policy makers and managers, some decisions are made without attention to existing scientific evidence or no localization is made during the use of this evidence. The studies on knowledge transfer resulting from research in Iran have indicated large gap between knowledge production and application of its results. It shows that these changes have only filled the gap in the quantitative dimension of knowledge transfer and still leaves a gap in the application of knowledge outcomes (Majdzadeh et al., 2009; Nedjat et al., 2008). Thus, it should not be overlooked that the barriers exist at all levels of research subject selection, collaboration of researchers with decision makers, awareness, and motivation to publish the findings in Iran (Nedjat et al., 2014) .

At Hamadan University of Medical Sciences (Iran), a large number of research projects are carried out each year, and Considerable amount of money and energy is spent by researchers and experts, but how efficiently the outcomes of costs and endeavors are transferred to the main

audience has not been investigated. This issue is especially important in the health domain, as increasing the time interval between knowledge production and its application can have adverse consequences for society, especially patients. Hence, given the key role of research utilization in the field of medical sciences, the present study investigates status of knowledge translation among faculty members of Hamadan University of Medical Sciences (Iran). The results of this study as an Iranian experience can be a model for evaluating the use of research knowledge for other universities.

Research Background

To measure the extent to which researchers are involved in the knowledge transfer process, Landry et al conducted a research with 1554 Canadian academic researchers during 1997 - 2007 in the field of engineering and natural sciences. The results showed that researchers have been more active in active knowledge transfer activities such as lectures and presenting results (Landry, Amara, & Ouimet, 2007). Newton et al. evaluated 260 researchers at the University of Alberta in Canada with the aim of determining the status of the knowledge translation process. Knowledge translation in practitioner researchers was significantly higher than in basic project researchers. Researchers' attitudes about the importance of knowledge translation components in the two groups of application designs and basic designs showed that the knowledge translation activities of application design researchers were significantly more than those of basic designs researchers (Newton et al., 2007). Results of studies by Girard et al. on knowledge translation and improving practices in neurological rehabilitation from managers' viewpoints indicated lack of organizational structure for the development of uniform knowledge translation among all physicians (Girard, Rochette, & Fillion, 2013). Lal et al. in their study of the trainees' challenges in knowledge translation in research and practice concluded that knowledge translation trainees experienced particular challenges in their work. Researchers ultimately concluded that for putting the health systems in better situations for continuous adaptation of knowledge to health care policy and practice, training efforts and capacity building for knowledge translation is required (Lal et al., 2015). In their study, Onyura et al. found five main obstacles to the use of research knowledge: low quality of research works, lack of appropriate knowledge transfer methods, workload, and lack of time, resistance of faculty and students against the change, and resource limitation (Onyura et al., 2015).   In a study by Jack et al., factors affecting the transfer and sharing of knowledge in the field of environmental health among Canadian communities were examined. The results showed that the most effective strategy for knowledge sharing is training research population at the beginning of the research(Jack, Brooks, Furgal, & Dobbins, 2010).

The tool used consists of two parts: Gagliardi et al. in their research conducted a semi-structured interview, identified research priorities, and provided the researchers with the final results. The decision makers and researchers were satisfied with the process (Gagliardi, Fraser, Wright, Lemieux-Charles, & Davis, 2008). Hosseini et al. stated that the researchers focused

more on producing usable evidence than other departments and that the level of knowledge translation activities at the university was moderate and below average (Hosseini et al., 2015).

Materials and Methods

This survey study was conducted at Hamadan University of Medical Sciences (Iran). The study population consisted of 457 faculty members of Hamadan University of Medical Sciences (Iran) who were working in the university in 2019. Using the Krejcie and Morgan table (95% confidence interval and 5% margin of error) and stratified random sampling, 208 individuals were selected as the study sample size. After obtaining informed consent from the study subjects and explaining the research topic and providing necessary explanations to the respondents, the data collection tool, which included a standard questionnaire (Dakhesh, Pouladi, Ostovar, Yazdizadeh, & Hamidi, 2018), and self-assessment of the faculty members' knowledge translation activities were given to respondents. The tool used consists of two parts: Demographic characteristics (gender, level of education, type of service, executive responsibility, work experience, education) and four main research variables included the Research question transfer (8 items), knowledge creation (12 items), knowledge transfer (18 items), promoting the research utilization (8 items) were used to measure the level of performance of researchers' knowledge translation using the Likert scale and the scoring scale for each item in the range of 1 to 5.

Finally, 187 questionnaires (90% of all questionnaires) were completed and returned. Data analysis was done by Stata software at the significant level of 0.05. To examine the relationship between demographic variables and variables of knowledge translation, including the knowledge creation, knowledge transfer, research utilization, question transfer, independent t-test, and one-way variance analysis were used.

Findings

The results showed that 54.01% of the faculty members were men. 68.11% of the members had a specialized PhD degree, 23.78% had a Doctor of Medicine (MD), and 8.11% had MA degree. More than half of the faculty members (51.1%) had no executive responsibilities. 51.12% of faculty members had more than ten years of working experience (Table 1).

Table 1. Frequency distribution of faculty members based on demographic variables

Variable	Class	Number	Percent
Gender	Male	101	01/54
	Female	86	99/45
Education level	MA	15	11/8
	Specialized Ph.D	126	11/68
	Doctor of Medicine (MD)	44	78/23
Executive responsibility	Yes	89	48.9
	No	93	51.1
Work experience	Below 5 years	47	26.4
	5-9 years	40	22.47
	10-19 years	46	25.84
	20 years and above	45	25.28

Frequency distribution of prioritization criteria of the research subject selection from viewpoints of faculty members of Hamadan University of Medical Sciences is presented in Diagram 1. Diagram 1 shows that the criterion of interest was the first priority of the research subject selection among the faculty members participating in the research. Then, the selection of the research subject based on the need of decision makers and review of literature were the second and third priority, respectively.

Research Subject Selection

■ interest   ■ need of decision makers   ■ review of literature

Diagram 1. Frequency distribution of prioritization criteria of the research subject selection

Table 2 indicates that, from viewpoint of faculty members, among the factors affecting the extent of university researchers' commitment to knowledge translation, "establishing a suitable structure in the university to accommodate research organizations with existing needs" was the first priority, "providing costs and funding sources for research aimed at translating knowledge" was the second priority, and "Orientation of regulations for faculty promotion and recruitment to knowledge translation" was the third priority (Table 2).

Table 2. Frequency distribution of prioritization of factors affecting commitment of university researchers to knowledge translation

Factor	Priority	Number	Percent
Orientation of laws of faculty promotion and recruitment to knowledge translation	First	47	41.23
	Second	21	18.42
	Third	46	40.35
providing costs and funding sources for research aimed at translating knowledge	First	26	24.30
	Second	62	57.94
	Third	19	17.76
establishing a suitable structure in the university to accommodate research organizations with existing needs	First	80	60.61
	Second	25	18.94
	Third	27	20.45

According to the description of knowledge translation activities among the faculty members, knowledge transfer had the highest score (3.12) and knowledge creation had the lowest score (2.54), and all activities were in relatively good condition (Table 3).

6

Table 3. Description of knowledge translation activities among the faculty members

Variable	Min. score	Max. score	SD ± Mean
Research Question transfer	1	4.88	2.64±0.79
Knowledge creation	1	5	2.54±0.71
Knowledge transfer	1.33	4.5	3.12±0.73
Knowledge Utilization	1	5	2.89±0.9

Most research participants (36.36%) scored themselves as 4-6 in the field of knowledge translation activity, and a small number of people in the study (11.22%) scored a score of 0-3 in the field of knowledge translation activity. The lowest and highest scores in the field of knowledge translation were respectively 0 and 10, respectively. The mean score of the subjects was 5.86±2.12 (Table 4).

Table 4. Distribution of absolute and relative frequency distribution of faculty members based on their score on the knowledge translation activity

Knowledge translation score	Number	Percent
0-3	21	11.22
4-6	68	36.36
7-10	65	34.75
No answer	33	17.64

The results of the research works by faculty members in terms of accountability to levels of decision makers showed that 42.78% of the participants adjust their research in response to policy makers, 32.08% adjust it in response to managers, and 6.95% of the respondents adjust their research to respond to both managers and policy makers. 18.18% of participants did not select any of the choices. The results also showed that faculty members adjust their research results to respond to researchers (46%), clinical professionals (40%), patients (31%), people (26%), and pharmaceutical companies (10%) (Diagram 2).
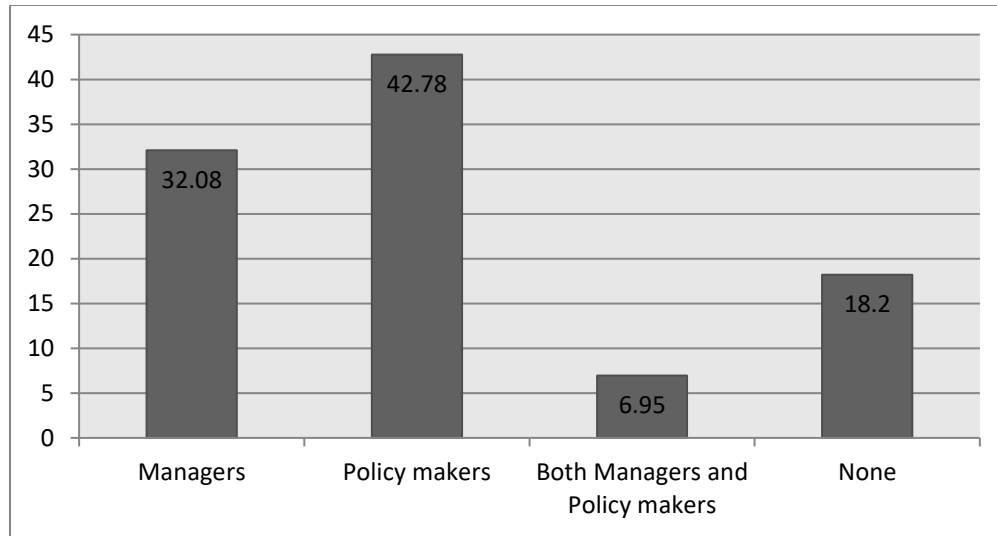
Diagram 2. Frequency distribution of faculty members' research results in response to decision makers

Table 4 shows that the score of the question transfer item is not significantly correlated with any demographic information. The relationship between knowledge creation score and gender was statistically significant (P = 0.004), so that the mean score of knowledge creation was higher in men than women. There was a significant relationship between knowledge transfer with gender (P = 0.024) and education level (P <0.001), so that the mean score of knowledge transfer in men and Ph.D. faculty members was higher than others. In addition, there was a significant relationship between knowledge utilization with gender (P = 0.02) and education level (P = 0.04).

Table 4. Comparative investigation of knowledge translation activities at levels of demographic variables among faculty members

Variable		Research Question transfer	p Value	Knowledge creation	p Value	Knowledge transfer	p Value	Knowledge utilization	p Value
Gender:	Male	0.79±2.74[*]		0.7±2.68		0.72±3.23		0.91±3.03	
			0.056		0.004		0.027		0.02
	Female	0.76±2.51		0.69±2.37		0.71±2.98		0.86±2.71	
Education level:	MA	0.85±2.6		0.78±2.27		0.52±3.18		0.5±2.72	
	Specialized Ph.D	0.75±2.63	0.98	0.7±2.56	0.34	0.68±3.24	< 0.001	0.9±3	0.04
	Doctor of Medicine (MD)	0.87±2.63		0.72±2.59		0.79±2.71		0.91±2.61	
Executive responsibility	yes	0.81±2.59	0.49	0.76±2.6	0.29	0.71±3.18	0.32	0.93±2.95	0.44
	No	0.76±2.67		0.65±2.49		0.75±3.06		0.86±2.85	
Work experience	Below 5 years	0.86±2.7		0.63±2.57		0.7±3.16		0.88±2.85	
	5-9 years	0.79±2.43		0.67±2.47		0.69±2.94		0.77±2.89	
	10-19 years	0.83±2.71	0.33	0.85±2.64	0.74	0.73±3.06	0.09	1.03±3	0.89
	20 years and above	0.64±2.68		0.71±2.54		0.74±3.35		0.87±3.35	

Mean ± SD*

9

Discussion and Conclusion

Knowledge has reduced the need for raw materials, labor force, time, space, and capital and has become one of the main sources of economics in developing societies; therefore, the creation of knowledge foundations, tools for knowledge development and its expanding in all dimensions should be one of the intellectual priorities of statesmen and managers of public and private organizations and institutions. One of the most important tasks of the academic community is the discovery, preservation, evolution, transfer, and utilization of knowledge, that is, knowledge translation; which can fill the gap between research and its applications (Babalhavaeji, tajedini, Noushinfard, & Hariri, 2013). Knowledge translation has been considered as one of the core aspects of knowledge management by some researchers. Many scholars have found that knowledge translation, especially in the current age when organizations have to use research findings to translate science to practice in order to stay competitive, is of the utmost importance. In fact, without knowledge translation, knowledge and knowledge management would not be effective. This study investigated the status of knowledge translators in Hamadan University of Medical Sciences (Iran).

The results of the study showed that there was no significant relationship between research question transfer and any demographic information. The relationship between knowledge creation score and gender was statistically significant. There was also a significant relationship between knowledge transfer with gender and education level and knowledge utilization with gender and education level. In the study of Hosseini et al., which examined the status of knowledge translation in Qazvin University of Medical Sciences from the viewpoints of faculty members, there was no significant difference between demographic variables and the status of producing usable evidence in decision making, which is consistent with the present study (Hosseini et al., 2015). Dakhesh et al. also indicated that there was no statistically significant relationship between the knowledge translation performance score of researchers with gender, field of study, degree, job status, type of service, work experience, in any area of the knowledge translation process (Dakhesh et al., 2018), which is consistent with the findings of current study. The results show that knowledge translation has little relation with demographic variables.

The results of the study showed that most faculty members adjust their research results in terms of response to policy makers (Diagram 2), while the study by Hosseini et al., who studied knowledge translation at Qazvin University of Medical Sciences, found that negligence to presence and opinions of representatives of administrative organizations is one of the barriers to knowledge translation activities (Hosseini et al., 2015). Participation, support, and investment by local governments in research is one way to create a sense of ownership over the results of their research and their application. To do this, interactive sessions should be held with the policy makers who need research results (Lomas, 2000). However, based on the response to user categories, the results showed that most faculty members adjusted their research results to respond to the researchers, and then the most frequency in adjusting the results of the research

was related to responding to clinical professionals. The lowest frequency was for pharmaceutical and medical companies. Arvanitis et al. in a survey of 2582 Swiss companies found that only 27% of all firms studied interacted with the university and participated in university transfer and knowledge transfer processes (Arvanitis, Sydow, & Woerter, 2008). It should be borne in mind that not using new knowledge in health decisions and practices, in addition to imposing additional costs, may also be harmful to patients (Barwick et al., 2005). To use this knowledge, the necessary infrastructures must be provided. One of these factors is developing an appropriate ground for communication and interaction between researchers and users of knowledge (Barwick et al., 2005), and researchers should be aware that users of this type of knowledge are mostly pharmaceutical, medical firms, and clinical professionals. Thus, the measures should be taken in relation to communication between the researchers and real users of knowledge.

For most faculty members, among the three factors of "Orientation of regulations for faculty promotion and recruitment to knowledge translation", "providing costs and funding sources for research aimed at translating knowledge" and "establishing a suitable structure in the university to accommodate research organizations with existing needs" in researchers' commitment to knowledge translation, the third factor, had the first priority among the factors affecting the extent of university researchers' commitment to knowledge translation (Table 2). The result of the study by Girard et al., which investigated knowledge translation and improving practices in neurological rehabilitation: managers' viewpoint showed that the lack of organizational structure to foster uniform knowledge translation among all physicians was one of the important factors for the lack of knowledge translation, which is consistent with the present study (Girard et al., 2013).

Most participants scored 4-6 score on knowledge translation activity to themselves. (Table 4). Asayesh et al. investigated validity of researchers self-evaluation about their own activities in knowledge translation (KT) at Golestan University of Medical Sciences (Asayesh et al., 2014). Results showed that the mean acquired score and mean score of self-evaluation were 3.52 and 5.47, respectively, which is consistent with the present study.

The research findings showed that status of knowledge transfer and transfer of data were relatively desirable (Table 3). The results of Amiri et al., which studied knowledge management in Hamadan University of Medical Sciences (Iran), showed that knowledge management status in this university was below average, which is inconsistent with the present study (Amiri M, 2011). Danaei et al. indicated that knowledge transfer status in Iran University of Social Welfare and Rehabilitation is moderate, which is in line with the present study (Danaei, Hosseini, Habibkhoda, Falahi, & Shokooh, 2010). Hosseini et al. showed that knowledge transfer status in Qazvin University of Medical Sciences is in poor condition, which is inconsistent with current study (Hosseini et al., 2015). Tajedini also indicated that the status of knowledge translation in the humanities in Iran is poor from the viewpoint of the faculty of humanities of the country, which is inconsistent with the present study (Tajedini, 2017). Valinejadi also showed that the

11

overall status of diabetes knowledge translation in Iran was lower than the ideal situation (Valinejadi, Sadoughi, & Salehi, 2016).

Iran is a developing country; it must be able to protect its research resources. Particularly in the current situation where the global economic crisis has become of international importance, enhancing knowledge translation will help better utilize research and allocate resources more appropriately for research and in sensitive areas. On the other hand, the concept of knowledge translation is nowadays popular in health sciences. To this end, in order to preserve life and prevent disease and disability, accelerating the knowledge-to-practice cycle, strengthening the health care system, making knowledge-based and informed decision-making and policymaking, and receiving feedback from the research target group, the need to implement the knowledge translation process dimensions in research organizations and other relevant health care centers is more felt. Results of the study indicated that in comparison of four domains of the cycle, the best status is related to knowledge transfer. That is, most of the faculty members' attention is now towards the publication of the article in journals and providing access to the research through traditional cycles in the form of publication and conference presentation. It is important to note that the topic of publishing a research paper in scientific journals and presenting conferences in seminars is available in the bylaws for promotion of university faculty members. This is one of the reasons for the higher mean score of knowledge transfer than other variables among faculty members. In order to have better utilization of the research works, other important steps are needed, from identifying and prioritizing problems to solving them. The knowledge creation domain has the lowest score, and this area needs serious attention.

The results showed that science creation at the University of Medical Sciences was done according to the needs of some researchers, based on the interest and activity of some researchers, and there was a long gap between theory and practice. Developing special organizations to engage specific groups or work in specific fields makes it easier for people to get into the field of knowledge transfer. On the other hand, the existence of a Knowledge Translation Committee in the Research Vice-Chancellor of the University can be used as strategies for improving the status of knowledge translation by defining specific tasks by encouraging researchers to carry out knowledge transfer activities (in addition to publishing the article) and allocating part of research budget to knowledge translation.

Acknowledgments:

References

Amiri M, Vakilimofrad, H. (2011). A survey on the knowledge of managers of Hamadan university of medical sciences. *Hamadn University of Medical Sciences*

Arvanitis, S., Sydow, N., & Woerter, M. (2008). Is there any impact of university–industry knowledge transfer on innovation and productivity? An empirical analysis based on Swiss firm data. *Review of Industrial Organization, 32*(2), 77-94.

Asayesh, H., Qorbani, M., Borghei, A., Rezapour, A., Mohammadi, Y., Mansourian, M., . . . Noroozi, M. (2014). The Validity Of Researchers Self Evaluation About Their Own Activities In Knowledge Translation (KT). *Journal of Payavard Salamat, 7*(5), 421-431.

Babalhavaeji, F., tajedini, O., Noushinfard, F., & Hariri, N. (2013). Composing Self-evaluation Tools for Knowledge Translation Related to Social Science Researchers. *Academic librarianship and information research, 47*(1), 49-64.

Barwick, M., Boydell, K., Stasiulis, E., Ferguson, H., Blase, K., & Fixsen, D. (2005). Knowledge transfer and implementation of evidence-based practices in children's mental health. *Ontario Canada: Children's Mental Health Ontario*.

Dakhesh, S., Pouladi, S., Ostovar, A., Yazdizadeh, B., & Hamidi, A. (2018). Psychometric of the Self-Assessment Tool of Academic Researchers Knowledge Translation Activities. *International Journal of Information Science and Management (IJISM), 16*(2).

Danaei, M., Hosseini, M., Habibkhoda, B., Falahi, M., & Shokooh, F. (2010). Knowledge Translation Status at The University of Social Welfare & Rehabilitation. *Journal of Medical Education Development, 2*(3), 9-16.

Gagliardi, A. R., Fraser, N., Wright, F. C., Lemieux-Charles, L., & Davis, D. (2008). Fostering knowledge exchange between researchers and decision-makers: exploring the effectiveness of a mixed-methods approach. *Health policy, 86*(1), 53-63.

Girard, A., Rochette, A., & Fillion, B. (2013). Knowledge translation and improving practices in neurological rehabilitation: managers' viewpoint. *Journal of evaluation in clinical practice, 19*(1), 60-67.

Hosseini, M., Ahmadi, S., Sadeghi, T., Mirbaha, S., & Safarizadeh, M. (2015). A Study on Status of Knowledge Translation in Qazvin University of Medical Sciences. *Research in Medical Education, 7*(2), 52-60.

Huber, G. P. (2001). Transfer of knowledge in knowledge management systems: unexplored issues and suggested studies. *European Journal of Information Systems, 10*(2), 72-79.

Jack, S. M., Brooks, S., Furgal, C. M., & Dobbins, M. (2010). Knowledge transfer and exchange processes for environmental health issues in Canadian Aboriginal communities. *International journal of environmental research and public health, 7*(2), 651-674.

Lal, S., Urquhart, R., Cornelissen, E., Newman, K., Van Eerd, D., Powell, B. J., & Chan, V. (2015). Trainees' Self-Reported Challenges in Knowledge Translation, Research and Practice. *Worldviews on Evidence‐Based Nursing, 12*(6), 348-354.

Landry, R., Amara, N., & Ouimet, M. (2007). Determinants of knowledge transfer: evidence from Canadian university researchers in natural sciences and engineering. *The Journal of Technology Transfer, 32*(6), 561-592.

Lomas, J. (2000). Essay: Using 'Linkage And Exchange'To Move Research Into Policy At A Canadian Foundation: Encouraging partnerships between researchers and policymakers is the goal of a promising new Canadian initiative. *Health affairs, 19*(3), 236-240.

Majdzadeh, R., Ahghari, S., Nedjat, S., Gholami, J., Maleki, K., & Yunesian, M. (2009). Interventions for Promoting Research Knowledge Translation: An Introduction. *Journal of Medical Hypotheses and Ideas, 3*, 18.

Majdzadeh, R., Sadighi, J., Nejat, S., Mahani, A. S., & Gholami, J. (2008). Knowledge translation for research utilization: design of a knowledge translation model at Tehran University of Medical Sciences. *Journal of Continuing Education in the Health Professions, 28*(4), 270-277.

Moin, M., Mahmoudi, M., & Rezaei, N. (2005). Scientific output of Iran at the threshold of the 21st century. *Scientometrics, 62*(2), 239-248.

Nedjat, S., Gholami, J., Yazdizadeh, B., Nedjat, S., Maleki, K., & Majdzadeh, R. (2014). Research's Practice and Barriers of Knowledge Translation in Iran. *Iranian journal of public health, 43*(7), 968.

Nedjat, S., Majdzadeh, R., Gholami, J., Nedjat, S., Maleki, K., Qorbani, M., . . . Ashoorkhani, M. (2008). Knowledge transfer in Tehran University of Medical Sciences: an academic example of a developing country. *Implementation Science, 3*(1), 39.

Newton, M. S., Estabrooks, C. A., Norton, P., Birdsell, J. M., Adewale, A. J., & Thornley, R. (2007). Health researchers in Alberta: an exploratory comparison of defining characteristics and knowledge translation activities. *Implementation Science, 2*(1), 1.

Onyura, B., Légaré, F., Baker, L., Reeves, S., Rosenfield, J., Kitto, S., . . . Armson, H. (2015). Affordances of knowledge translation in medical education: a qualitative exploration of empirical knowledge use among medical educators. *Academic Medicine, 90*(4), 518-524.

Pournaghi R, N.-A. L. (2014). The course of research in the field of knowledge translation *Journal of Knowledge Studies, 1*(1), 33-52.

Pournaghi, R., & Nemati-Anaraki, L. (2015). The Mutual Role of Scientometrics and Foresight– A Review. *Collnet Journal of Scientometrics and Information Management, 9*(2), 145-160.

Sadighi, J., & Majdzadeh, R. (2008). Knowledge translation and utilization of research results. *Tehran Univ Med Sci, 3*, 1-15.

Tajedini, O., Babalhavaeji, F., Moosavi. (2017). Study of the status of knowledge translation in the Humanities in IRAN. *10*(38), 25-36

Valinejadi, A., Sadoughi, F., & Salehi, M. (2016). Diabetes knowledge translation status in developing countries: A mixed method study among diabetes researchers in case of Iran. *International journal of preventive medicine, 7*.