Assessing Knowledge Translation in Iranian Medical Research Centres

Niloofar Mohaghegh
Instructor, Department of Library and Medical Information Sciences, Iran University of Medical Sciences, Tehran, Iran.

Maryam Zarghani
MSc, Department of Library and Medical Information Sciences, Tehran University of Medical Sciences, Tehran, Iran.

Iman Tahamtan
Ph.D. Student, School of Information Sciences, College of Communication and Information, University of Tennessee, Knoxville, TN, USA, Corresponding author:Tahamtan@Vols.Utk.Edu.

Ahmad Ghasghaee
BSc student, Department of Health management, Iran University of Medical Sciences, Tehran, Iran

Sorayya Mousavi
MSc student, Department of Library and Medical Information Sciences, Tehran University of Medical Sciences, Tehran, Iran

Abstract

Research centres have been always trying to promote their knowledge translation activities. Thus, understanding the status of knowledge translation in research centres is of high importance. The aim of this study was to investigate the status of knowledge translation in Iranian medical research centres to identify their weaknesses and strengths. This was a cross-sectional and descriptive study. To collect the data, we used a self-assessment tool which consisted of four domains: "research question", "knowledge production", "knowledge transfer", and "the use of evidence". Data was analyzed using SPSS and descriptive statistics. The mean score of "knowledge translation" in the studied research centres was 3.21 (SD= 0.69, *Median*= 3.29). "Knowledge production" obtained the highest score (M= of 3.6, SD= 0.72), followed by "knowledge transfer" (M=3.16, SD =0.76), "research question" (M=3.09, SD= 0.73), and "the use of evidence" (M= 2.95, SD= 0.98). Medical research centres had a proper situation in all aspects of knowledge translation. However, they should try to identify and prioritize the research questions of stakeholders and target groups by making more efficient relationship with them. They should also prepare appropriate reports of research results and should consider enough budgets for disseminating the reports among target groups and healthcare decision makers in order to allow them understand the actionable message of research results.

Keywords: Translational Medical Research, Knowledge management, Knowledge transfer, Knowledge sharing, Knowledge production.

Introduction

Despite the extensive investment in medical research, current research projects do not lead to effective care in healthcare system (Berwick, 2003). Nearly all stakeholders in both developed and developing countries, who are involved in healthcare decision making face

with the challenges in knowledge translation for promoting the use of evidence (Gholami et al., 2013). The use of research is not possible except with using the proper knowledge translation activities (Gholami et al., 2011). "Knowledge translation" is defined as turning knowledge into action which includes "knowledge creation" and "knowledge application" to improve taking advantage of research benefits (Graham et al., 2006).

The importance of knowledge translation in healthcare system is more recognized when we understand that in most countries, the government is the main source of financial support for medical research, and that few research grants in low and middle income countries (i.e developing countries) are supported by non-governmental or private sectors (Gholami et al., 2013). Resource shortage specifically in developing countries has increased the importance of knowledge translation to improve healthcare decision making by the proper use of research results (Cordero et al., 2008; Santesso & Tugwell, 2006).

Because of the rapid growth of medical research in Iran and lack of enough research funding, there is an emerging recognition of the importance of knowledge translation in Iranian research centres (Gholami et al., 2013). A number of studies have examined the status of knowledge management and translation in Iranian research centres (Akhavan, Hosnavi, & Sanjaghi, 2009; Gholami et al., 2013; Gholami et al., 2011; Nedjat et al., 2008; Ramezani, Fathain, & Tajdin, 2013), as indicated in table one.

Table 1
Studies that have investigated knowledge management and translation in Iranian research centres and their main findings

Reference	Studied subject	Important notes
Gholami (2013)	Status of knowledge translation in Iranian medical science universities	Iranian universities did not have an appropriate context for knowledge translation. Significant shortcomings were identified in supportive regulations, facilities for knowledge translation activities, and the level of interaction between the researchers and research users
Ramezani (2013)	Knowledge management critical success factors in research organizations	This study identified eight distinct KM factors including 22 different critical elements for KM implementation in Iranian research organizations The first step for the successful implementation of KM is to consider cultural aspects in a research organization
Gholami (2011)	Designing a knowledge translation self-assessment tool for research institutescentres	This tool helps universities and research organizations to assess their knowledge translation status, and design interventions appropriate to their own organization centres
Akhavan (2009)	Knowledge management critical success factors in academic research centres	"Human resource management and flexible structures," "KM architecture and readiness," "Knowledge storage," "Benchmarking," and "chief knowledge officer" are critical factors for KM implementation in Iranian academic research centres
Majdzadeh (2008)	Design of a knowledge translation model for research utilization	The knowledge translation model has five domains: knowledge creation, knowledge transfer, research utilization, question transfer, and the context of organization

Reference	Studied subject	Important notes
Nedjat (2008)	Knowledge transfer in research projects	Academicians do not give priority to active strategies of knowledge transfer (i.e. preparation and delivery of texts suitable to the users, presenting results to mass media, and holding briefings with stakeholders)

As knowledge translation process is not as well utilized in Iranian research centres, they are looking for the ways to promote their knowledge translation activities (Majdzadeh, Nedjat, Fotouhi, & Malekafzali, 2009). Thus, we decided to assess the strengths and weaknesses of knowledge translation in Iranian medical research centres. This study aims to answer to the following questions: 1) Do Iranian medical research centres identify decision makers' research needs and convert them into research questions?, 2) Do Iranian medical research centres produce useful evidence for decision making?, 3) Do Iranian medical research centres have appropriate means for disseminating the organization's research results to their target audiences?, and 4) Do Iranian medical research centres help decision makers utilize research results better?

Materials and Methods
Setting

This was a descriptive study conducted on all research centres at Tehran University of Medical Sciences (TUMS) and Iran University of Medical Sciences (IUMS). We chose TUMS and IUMS because they were among the top ranked universities in Iran.

Study tool

The study tool was developed by Gholami et al (2011) which is a validated knowledge translation self-assessment tool for research organizations to assess their knowledge translation status and identify their weaknesses and strengths. This tool consisted of 50 statements in four main domains as follows (Gholami et al., 2011):

1- First domain (research question): This domain assesses whether or not research centres could identify the research needs of decision makers and convert them into research questions. This domain consists of two sub-domains of resources (with four statements) and strategies (with eight statements).

2- Second domain (knowledge production): This domain assesses whether or not research centres produce useful evidence for decision making. This domain includes nine statements.

3- Third domain (knowledge transfer): The third domain assesses whether or not research centres have appropriate facilities for disseminating their research results to target audiences. This includes two sub-domains of resources (with nine statements) and strategies (with 16 statements).

4- Fourth statement (promoting the use of evidence): The fourth statement assesses whether or not research centres have the capacity to help decision makers employ the research results better. The last domain consists of four statements.

In the study tool, each statement assesses at least one of the aspects that affect the knowledge translation process. For instance, a statement related to the fourth domain of the

study tool (promoting the use of evidence) is "systematic reviews and clinical guidelines, etc. that strengthen evidence-based decision making are produced in our organization". In addition, each item covers a range of five options from "the situation is good and needs no intervention" to "the situation is quite unfavourable and/or there is an urgent need for intervention" (Gholami et al., 2011). For more information about the study tool and the methodology used in this study refer to Gholami et al (2011).

Samples

The study tool was distributed among all 102 research centres which were affiliated to TUMS and IUMS; among which just 68 consented to participate in the study. To evaluate research centres, we asked the head of each research centre to answer the self-assessment questionnaire. In cases we had no access to the head, the deputy head filled out the questionnaire.

Ethical considerations

To ensure confidentiality, no information regarding the respondents and the research centres was recorded.

Data analysis

To analyse the data, we used the method described by Gholami et al (2011): Thus, the mean score and standard deviation of each statement were calculated. The option "the situation is quite unfavourable and/or there is an urgent need for intervention" scored 1 and the "situation is good and needs no intervention" scored 5 points. Data was analysed using SPSS and descriptive analysis.

Results

Among the research centres, 45 (66.2 percent) were affiliated to TUMS and 23 (33.8 percent) were affiliated to IUMS. The mean score of knowledge translation in the studied research centres was 3.21 (*SD*= 0.69, *Median*= 3.29). "Knowledge production" obtained the highest score with a mean score of 3.6 (*SD*= 0.72), followed by "knowledge transfer" (*M*=3.16, *SD* =0.76), "research question" (*M*=3.09, *SD*= 0.73), and "the use of evidence" (*M*= 2.95, *SD*= 0.98). The status of knowledge translation in the research centres at TUMS (*Mean*=3.23, *SD*= 0.53, *Median*= 3.28) was better than research centres at IUMS (*Mean*=3.17, *SD*= 0.94, *Median*= 3.34).

Tables 2, 3, 4 and 5 indicate the score of each statement and the mean of each of the statements in the four domains of knowledge translation. The statements which obtained the lowest scores reflected issues that were in poorer conditions and needed interventions by authorities (specified with ↓). The statements with highest scores were issues that had good conditions and no intervention was needed for them (marked with ↑).

The minimum and maximum mean scores for statements in "research question" were 2.54 and 3.58, respectively. In this domain, none of the statements were below the first quartile (2.52), indicating that totally this domain had a good situation in research centres. However, securing external grant (statement 10), the amount of external funding (statement 4), availability of each unit's capabilities (statement 2) and determining priorities through meetings with stakeholders (statement 8) needed more attention.

Table 2

The mean score and standard deviation for the statements of "research question" in Iranian medical research centres

	Statement	Mean	SD
	Resources		
1	In our organization there is a comprehensive list of organizations that can use our research results	3.02	1.21
2	The particulars of each unit's researchers and their capabilities are made available to other organizations through a databank	2.76	1.19
3	A website and/or data bank is available in our organization for notifying the research priorities of other organizations	3.41	1.19
4	Compared to the organization's internal budget for research, the amount of external funding is such that researchers are encouraged to use external funding	2.69	1.09
	Strategies		
5	Regular meetings are held for the exchange and identification of research priorities of individuals and/or research-using organizations	3.23	1.33
6	Individuals and decision-maker organizations know which fields our organizations' research capacities cover ↑	3.58	1.13
7	For preparing grounds for performing related research and strengthening research utilization, our organization holds regular and purposeful meetings with decision-makers (managers and policy makers) for extending cooperation and using mutual capacities (establishment of knowledge network)	3.26	1.16
8	Our organizations' research priorities are determined through meetings with executive organizations' representatives and/or users of research results (like community representatives, patients etc)	2.82	1.20
9	Our organizations' research priorities are compiled and its up-to-date list is available to the organizations' researchers	3.48	1.17
10	Compared to the internal process, the external grant securing process is such that researchers are encouraged to use external funding. (the extra-organizational part of the process) ↓	2.54	1.12
11	In case of external funding, researchers can use these for research matters easily and in a short period of time. (the intra-organizational part of the process)	3.13	1.31
12	Incentives exist for our researchers for securing external funding	3.10	1.17

The minimum and maximum mean scores for statements in "knowledge production" were 3.13 and 4.05, respectively. In knowledge production, considering budgets in research proposals for knowledge translation (statement 9), participation of target groups in the conduction and design of research (statement 2), quality assurance program and control needed more intervention than other statements. In this domain no statement was below the first quartile (3.02), while the third statement scored more than the third quartile (4.00).

Table 3

The mean score and standard deviation for each statement in "knowledge production" in Iranian medical research centres

	Statement	Mean	SD
1	Researches that result in production of 'actionable messages' with a high level of evidence (such as regular systematic reviews and/or clinical guideline development activities) are considered priorities of research and granted funds	3.69	1.02
2	The groups which will use the results of research, participate in its conduction and/or design	3.35	1.14
3	Our impression is that the users of research results trust the quality of the researches done in the organization ↑	4.05	0.92
4	Quality assurance program is required for each research (data gathering protocol and/or training the research workers)	3.41	1.16
5	Quality control is carried out while research is being conducted (internal monitoring of the executive program by the research group and/or external supervision)	3.51	1.17
6	The gap between 'presentation of the research proposal' and 'beginning of the research' is reasonable (the process of reviewing the research proposal	3.73	1.12
7	While designing the research proposal and performing the projects researchers are aware that applied projects should reach results in good time (the projects duration and absence of delay in performing them)	3.76	1.05
8	The gap between 'end of research' and 'finalization of results in the form of a report' is reasonable (the process of presentation of research results)	3.80	0.99
9	In research project proposals (projects whose users are service providers, managers, policy makers, patient groups and/or people) budget is considered for disseminating the results (other than being published in peer-review journals and/or attending conferences) ↓	3.13	1.13

The minimum and maximum mean scores for statements in "knowledge transfer" were 2.75 and 3.82; and for statements in "promoting the use of evidence" were 2.70 and 3.17, respectively. In the third domain, similar to the previous two domains, no statement scored below the first quartile (2.70). However, the communication of research centres with public and private media and target groups to disseminate the knowledge, financial resources for changing the results of scientific studies into the content which is appropriate for the public and the necessary infrastructure and manpower for knowledge transfer, needed more attention. Statement 11 (peer reviewing process prior to knowledge transfer) scored above the third quartile (3.75). In addition, in the domain of "promoting the use of evidence", reminding decision makers to follow research results obtained the lowest score and researchers' active role in decision making obtained the highest score (Table 5).

Table 4

The mean score and standard deviation for each statement in 'knowledge transfer' in Iranian medical research centres

	Statement	Mean	SD
	Resources		
1	Researchers are familiar with the topic of knowledge translation and how to perform it	3.57	1.21
2	Our researchers have communication skills for knowledge transfer	3.48	1.08
3	Our researchers can use the services of those familiar with knowledge transfer skills (the presence of individuals in our organization who work with this objective; and/or make contracts with individuals and institutions outside our organization)	3.36	1.22
4	Our researchers have the necessary financial resources for preparing content appropriate to the target audience	2.75	1.11
5	Our researchers have the necessary equipment for preparing content appropriate to the target audience	3.20	1.20
6	The necessary structure (like office and/or organizational unit) and/or manpower is available for strengthening knowledge transfer in our organization, considering the produced amount of research-based knowledge transferable to the decision makers	2.79	1.20
7	The framework of research projects' final reports is such that decision makers can easily point out the actionable message	3.58	1.01
8	Intellectual property rights exist which support researchers who help disseminate research results prior to their publication in journals	3.41	1.27
9	There are criteria for evaluation of researchers' knowledge transfer activities in our organization	3.17	1.31
	Strategies		
10	In our organization there is a process that determines which research results can be transferred (keeping in mind the fact that not every research result is transferable) to the target audiences (apart from other researchers and funders)	2.94	1.18
11	In our organization, all research results are peer reviewed prior to knowledge dissemination or transfer ↑	3.82	1.03
12	Our researchers convert their research results into actionable messages appropriate to the target audience	3.57	0.99
13	Our researchers have adequate time for preparing content appropriate to the target audience	3.50	1.12
14	Our researchers have the necessary incentives for performing knowledge transfer (rewards, appropriate promotion rules)	3.20	1.28
15	Knowledge transfer and utilization of research results exist in the general program of research methodology training	3.16	1.25
16	A list of all the (research result users) is prepared for each research project	3.04	1.11

No		Mean	SD
17	Our organizations' research managers are aware of the researchers needs (separately for each study field-group etc) in the field of knowledge transfer, and perform proper interventions for them	2.95	1.08
18	The format of peer review journals which publish research results is such that the decision makers are easily informed of the actionable message when necessary	3.26	1.26
19	The gap between sending the article and its publication in journals is such that the interventions that result from research can be implemented in reasonable time (considering the need for prompt availability of research results to decision makers).	2.85	1.09
20	Researchers can provide the results of their research through the web and/or electronic banks	3.01	1.29
21	Meetings are held for presentation of research results to decision makers	2.91	1.26
22	Our organization has regular communications with public and private media and target audiences (like publications related to women and youth) for transfer of research-based evidence ↓	2.58	1.18
23	Evidence-based decision making (based on domestic and/or foreign research) is among the subjects of research in our organization	3.10	1.21
24	Our researchers study the extent to which decision makers utilize our organizations' research results	2.85	1.16
25	Our researchers identify the potential barriers of behavioural change in decision makers for utilizing their research results	3.04	1.20

Table 5

The mean score and standard deviation for each statement in "promoting the use of evidence" in Iranian medical research centres

No	Statement	Mean	SD
1	We conduct education programs such as 'evidence-based medicine' or 'evidence-based decision making' for service providers and/or managers	2.91	1.20
2	Systematic reviews and clinical guidelines...etc that strengthen evidence-based decision making are produced in our organization	3.04	1.09
3	Our researchers play an active role in technical committees that help in decision making (executive organizations' decision making, hospital management and also groups supporting the health of patients and people) ↑	3.17	1.19
4	We send decision makers reminders to follow the research results that we've previously sent them ↓	2.70	1.33

Discussion

This study assessed knowledge translation in sixty-eight Iranian medical research centres. We hope this study would help research centres to recognize their strengths and weaknesses in terms of knowledge translation process and to identify necessary solutions for better improvement. Moreover, this would help to enhance knowledge translation substructures and capacities by intervening in the issues that were weak.

This study indicated that the studied research centres had a suitable situation in knowledge translation, while a number of recent studies showed that the Iranian universities

did not have appropriate situation for knowledge translation and there were important shortcomings in infrastructures and facilities for knowledge translation activities (Gholami et al., 2013; Gholami et al., 2011; Majdzadeh et al., 2009; Majdzadeh, Sadighi, Nejat, Mahani, & Gholami, 2008). The medical research centres in our study, were good in identifying decision makers' research needs and converting them into research questions, producing useful evidence for decision making, disseminating the organization's research results to their target audiences, and promoting the use of evidence. Regarding the mean score of each domain of knowledge translation, "knowledge production" had the best situation in research centres followed by, "knowledge transfer", "research question" and "the use of evidence", respectively.

This study indicated that the research centres affiliated to TUMS had a better situation than research centres affiliated to IUMS in all aspects of knowledge translation, except in promoting the use of evidence. In contrast to our findings, some studies have shown that Iranian medical research centres specifically those affiliated to TUMS were unfavourable in knowledge translation and an urgent need for intervention was required (Gholami et al., 2013; Gholami et al., 2011; Nedjat et al., 2008). Maybe emphasizing the necessity of implementing knowledge translation in research centres by previous studies has resulted to paying more attention to knowledge translation activities. In addition, probably the high research budget obtained by TUMS and IUMS has led to more effective strategies to implement knowledge translation activities in their research centres. This may be argued that there is a relationship between the status of knowledge translation in research centres and the national rank of these research centres with regard to the number of publications and citations.

The first question assessed the capacity of medical research centres in identifying decision makers' research needs and converting them into research questions. The studied research centres had a good situation in this domain of knowledge translation. However, findings indicated that there were weaknesses in some aspects. Based on the viewpoints of respondents, research priorities were not determined as well through meetings with users of research results. Previous studies have also noted that lack of effective communication with stakeholders and users of research results were among the weaknesses of research centres (Gholami et al., 2013). Researchers preferred to use the internal funding rather than the external funding due to the limitations in obtaining grant from sources outside the research centres. Furthermore, results indicated that organizations didn't have enough access to the professional characteristic of researchers and their capabilities. The weak relationship between stakeholders and research centres may lead to a bilateral distrustfulness and may negatively influence identifying the actual research needs of target groups in order to convert them into research questions.

The second question assessed the status of "knowledge production" in research centres. Research centres were good in the production of knowledge with high level of evidence. However, our study indicated that in research projects, budget was not as well considered for disseminating the results. This was consistent with the findings of Gholami et al (2011). In both studies, this statement obtained the lowest score. According to the findings, research centers believed that in the knowledge production phase, similar to the previous domain (research question), there was not a suitable relationship between research centres and users

of research results. Our study also found that the groups which had used the results of research projects have had little participation in the research conduction and design. According to the viewpoints of respondents, users of research results trusted the quality of the research produced by the studied research centres. However weak relationships could affect this trustfulness in the future.

The third question evaluated "knowledge transfer" in research centres. Knowledge transfer and exchange can improve transfer of research outcomes to target audiences properly. While a number of studies indicated that Iranian research centres have paid little attention to knowledge transfer in research projects and articles (Majdzadeh et al., 2008); in our study medical research centres had a good situation in this aspect. Our results in some statement were consistent with the results of Gholami et al (2011). Findings indicated that there were limited financial resources for preparing content appropriate to the target audience. Due to the heterogeneous sample of target audience, different mechanisms for research initiation, development and dissemination is required in research organization (Smits & Denis, 2014). Our study indicated that the necessary structure and manpower was not available for improving knowledge transfer in medical research organizations. Similar to previous domains, research organizations had limited communications with public and private media and target audiences for the proper transfer of research-based evidence. Maybe the weak relationship between research organizations and stakeholders and target audiences is a major obstacle in all domains of knowledge translation, specifically knowledge transfer.

The fourth question assessed "promoting the use of evidence". Results indicated that this domain needed more attention and intervention than previous domains of knowledge translation. According to the results, the studied research centres should do a better job in sending reminders to decision makers for following the research results in order to promote the use of evidence. Other studies in Iran also indicated that research centres didn't work well in sending reminders to decision makers and in promoting and evaluating the use of evidence (Gholami et al., 2013; Gholami et al., 2011). Promoting knowledge translation and the use of evidence in the health system of developing countries can be facilitated through establishing successful knowledge networks which can manage efforts made by health research centres (Yazdizadeh, Majdzadeh, Alami, & Amrolalaei, 2014). Our results showed that medical research centres did not have an appropriate context for promoting the use of evidence. Thus, it is suggested to employ more educational programs in issues such as "evidence-based medicine" or "evidence-based decision making" for managers to promote the use of evidence in research centres.

This study had some limitations. Findings cannot be generalized to other research centres as we just studied 68 medical research centres in two universities. Further studies with larger sample sizes are required to assess the situation of knowledge translation in Iranian research centres. In addition, the instrument used in this study was a self-assessment tool, allowing research centres to understand their own weaknesses and strengths. Thus, in cases the tool is used for research purposes, like current study, probably some biases exist in the given responses.

Conclusion

This study indicated that medical research centres had a proper situation in knowledge translation. They were good in identifying decision makers' research needs and converting them into research questions, producing useful evidence for decision making, disseminating the organization's research results to their target audiences, and promoting the use of evidence. However, research centres should make more efficient relationship with target groups and stakeholders to identify and prioritize their research questions. In research projects the target users of research results should be determined and enough budgets should be allotted for disseminating the results among them. Research centres should also provide target groups with the reports of the research results so that they can easily understand the actionable message. In addition, they should assess the extent to which decision makers utilize the results of research conducted by them in order to promote the use of evidence among them.

Acknowledgements

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