



RESEARCH ARTICLE

KNOWLEDGE GENERATION, KNOWLEDGE TRANSFER, KNOWLEDGE PROMOTION, AND THE APPLICATION OF SCIENTIFIC EVIDENCE IN SHAHREKORD UNIVERSITY OF MEDICAL SCIENCES

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ABSTRACT

**Introduction:** Knowledge transfer is a process by which research results will be transferred to users and decision makers. Nowadays, knowledge alongside its application is one of the most important factors for survival of organizations and universities in the world. This study was conducted to evaluate knowledge transfer in Shahrekord University of Medical Sciences.

**Methods:** This is an epidemiological, cross-sectional, descriptive-analytical study with Research and Technology Deputy of (research centers affiliated to) Shahrekord University of Medical Sciences as research community and a 38-individual sample size. Data were gathered through a four-index, 50-item questionnaire with authenticated reliability and validity. Data were analyzed with SPSS software.

**Results:** The mean  $\pm$  standard deviation of the four indices of knowledge transfer based on research question, knowledge generation, knowledge transfer, and knowledge and scientific evidence promotion was, respectively,  $31 \pm 1.8$ ,  $27.1 \pm 8.1$ ,  $37.7 \pm 18.4$ , and  $11.2 \pm 4.2$ . The total mean  $\pm$  standard deviation for knowledge transfer in Shahrekord University of Medical Sciences was  $143 \pm 35$  from the total 250. The general status of knowledge generation, knowledge transfer, and knowledge promotion in the University was 73.6% acceptable and 26.4% weak and unacceptable.

**Conclusion:** Generating and applying knowledge has been recognized as a necessity for universities to compete and survive. Shahrekord University of Medical Sciences should consider the process of knowledge and research evidence transfer to live effectively, to maintain the present status in rank three medical universities, and to promote to rank two. This university requires a more sophisticated planning to achieve these purposes.

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INTRODUCTION

Knowledge transfer is a process by which medical documentation and evidence will be, through some tools such as biomedical research, transferred to target groups (policy-makers, providers of clinical and health cares, decision-makers, and service users) by media and different methods of knowledge transfer to be applied in decision making and practice (Schmoch, 2005). Nowadays, knowledge is the most important competitive advantage of universities and organisations in national and global economic arenas. Knowledge generation and its application is recognised as a requirement for competition and survival of universities and organisations (Landry *et al.*, 2006). The aim of clinical, medical, and population-based research is to improve and promote the health outcomes in patients. Knowledge transfer plays an essential role in determining whether these documentation have achieved these goals or not. Knowledge transfer is referred to a systematic approach to access, to collect, and to share conceptual knowledge in order to be turn it into clear knowledge which enables individuals and organizations to access and apply the necessary information formerly owned by only one person

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or a small group. From the researchers' points of view, activities of knowledge transfer are generally fall into two categories: active and inactive (Qorbani *et al.*, 2010). Converting the research results into the practice is the management of change in knowledge transfer. In order to make this change applicable, we should determine the barriers and facilitators (Majdzadeh *et al.*, 2009). Most of those who are engaged in subsequent change in knowledge generation believe that it is better, in view of several barriers affecting the process of converting research into practice, to illustrate the factors influencing knowledge transfer in the form of a model (Majdzadeh *et al.*, 2009; Sadighi *et al.*, 2008). Based on the research carried out in the U.S and the Netherlands, the researchers estimated that about 30 to 45 % of patients, based on the scientific evidence, receive no care and 20-25% receive unnecessary or potentially harmful cares. It is also estimated that optimal application of what has already been known could improve cancers' consequences by 30% and utilization of accessible therapeutical methods could decrease cancer-associated mortalities by at least 10% (Qorbani *et al.*, 2010; Majdzadeh *et al.*, 2009; Sadighi *et al.*, 2008; Rinia *et al.*, 2002). A study of the research articles on Iranian populations demonstrated that only 12.2% of them both had a clear message and addressed the audience directly (Nedjat *et al.*, 2009a). Filling the gap between research and practice, including clinical care

given by service providers and/or decision making and policy making in the health system, requires linking research and practice and making the worlds of researchers and decision-makers much closer (Estabrooks *et al.*, 2006). The aim of this study is to determine the status of knowledge generation, knowledge transfer, and also how to promote the application of scientific evidence in Shahrekord University of Medical Sciences (SKUMS) as the winner of the First Award in Razi Research Festival for eight consecutive years among rank three medical universities.

## MATERIALS AND METHOD

This is an epidemiological, cross-sectional, decriptive-analytical study. The research community is at the level of research and technology deputy, that is, the research centers and researchers affiliated to SKUMS including deputy, managers, and experts. The sample of this study was 38 individuals who were enrolled using census in the Deputy of Research and Technology and the affiliated units of SKUMS. Data were gathered through a questionnaire (a self-assessment tool for the research centers that conduct research). The questionnre was translated and standardized by Center for Academic and Health Policy Research of Tehran University of Medical Sciences (Nedjat *et al.*, 2008a). The tool used in this study included four areas and 50 items. The content validity of the questionnaire was examined and approved by five experts. Reliability of the questionnaire in the areas of research question, knowledge generation, and knowledge transfer was 0.7-0.86 according to the intraclass correlation coefficient and Cronbach's alpha, which has already been reported as satisfactory (Nedjat *et al.*, 2008b). The items of the four areas of knowledge transfer assessment questionnaire are based on 5-point Likert scale (from strongly disagree to strongly agree) and the scores range from 1 to 5. In the research question, knowledge generation, knowledge transfer, and promotion of evidence application, the minimal and maximal attainable scores were respectively 12 and 60, 9 and 45, 25 and 125, and 4 and 20. The whole questionnaire consisted of 50 items with the minimal and maximal attainable scores of 50 and 250. To determine the priorities among the common and major problems of SKUMS based on the four

areas, focus group discussions and expert opinions were used. The data were analyzed by SPSS 14 using chi-square.

## RESULTS

Examining descriptive indices indicated that the mean and standard deviation of the four areas of knowledge transfer in terms of the research question, knowledge generation, knowledge transfer, and knowledge and evidence promotion was  $31 \pm 1.8$ ,  $27.1 \pm 8.1$ ,  $37.7 \pm 18.4$ , and  $11.2 \pm 4.2$  respectively (Table 1). The total mean and standard deviation of the knowledge transfer was  $143 \pm 35$ . Knowledge transfer in terms of the research question was evaluated as 15.5% acceptable and 66% weak. The rate of knowledge generation was 60.5% acceptable and 23.7% weak. Knowledge transfer in SKUMS was 73% acceptable and 26.4% weak and unacceptable. The status of knowledge promotion in SKUMS was estimated 18.4% acceptable and 42% weak. Finally, overall status of SKUMS in these four areas was evaluated as 73.6% acceptable (Table 2). Of common and main problems of SKUMS in the four areas, the most common one was related to failure to move toward making research order-based in the area of knowledge transfer based on research question, considered as the first priority and the least common was related to failure to create a cooperative network and genuine connection with the users of the research to determine the research question, considered as the last priority. In knowledge generation, failure to cooperate with the users of the research results in several steps was the first priority, and conducting too little appropriate research at the right time with transferable messages and high quality was offered as the next priority. In knowledge transfer area, failure to plan for assessment of the results' application by the users was considered as the first priority. The last priority was inadequate facilities such as websites, unsatisfactory training of knowledge transfer in methodology workshops, variability in journals' format, and failure to provide the list of research results' users. In the promotion of evidence application, failure to support for or involve in decision making for using the research results was considered as the first priority and failure to conduct sufficient training programs for services' providers and decision makers, such as evidence-based medicine or evidence-based decision making, was the last priority (Table 3).

**Table 1. Descriptive indicators of knowledge transfer in Shahrekord University of Medical Sciences in 2010**

The area	Maximum expected score	Indices				
		Mean	Maximum	Minimum	SD	Median
Research question	60	31	41	17	1.8	36
Knowledge generation	45	27.1	36	11	1.8	29
Knowledge transfer	125	37.7	92	32	4.18	82
Knowledge promotion	20	11.2	18	4	2.4	12
Overall status	250	143.1	178	69	8.35	166

**Table 2. Knowledge generation, transfer, and promotion in Shahrekord University of Medical Sciences in 2010**

	status	Range of scores	number	percentage	P value	Chi-square
Research question	unacceptable	12-24	7	5.18	<b>001.0</b>	
	weak	25-37	25	66		
	acceptable	38-48	6	5.15		
	desirable	49-60	0	0		
Knowledge generation	unacceptable	9-18	6	8.15	<b>001.0</b>	
	weak	19-28	9	7.23		
	acceptable	29-38	23	5.60		
	desirable	37-45	0	0		
Knowledge transfer	unacceptable	25-50	5	2.13	<b>001.0</b>	
	weak	51-76	9	7.23		
	acceptable	77-99	24	73		
	desirable	100-125	0	0		
Knowledge promotion	unacceptable	4-8	10	4.26	<b>01.0</b>	
	weak	9-13	16	42		
	acceptable	14-17	7	4.18		
	desirable	18-20	5	2.13		
Overall status	unacceptable	50-99	5	2.13	<b>001.0</b>	
	weak	100-124	5	2.13		
	acceptable	125-187	28	6.73		
	desirable	188-250	0	0		

**Table 3. The list and prioritization of common and major problems of Shahrekord University of Medical Sciences based on the four areas in terms of knowledge transfer in 2010**

	Major problems	priority	prevalence
Research question	1. Lack of familiarity with the research users and recognising their needs and priorities	third	<b>40</b>
	2. Unsatisfactory introduction of organization and research priorities to research users	second	<b>48</b>
	3. Failure to create cooperative and actual communication networks with research users to determine research question	fourth	<b>34</b>
	4. Failure to move towards making research order-based	first	<b>86</b>
Knowledge generation	1. Low generation of high quality and appropriate research with transferable messages at the right time	second	<b>40</b>
	2. Lack of cooperation with research users in various steps of the project	first	<b>60</b>
Knowledge transfer	1. Inadequate selection of appropriate research for message transfer	sixth	<b>39</b>
	2. Low level of skills, motivation, and capabilities of researchers in knowledge transfer	second	<b>58</b>
	3. Failure to provide adequate resources and necessary equipment and facilities for researchers for knowledge transfer	sixth	<b>39</b>
	4. Inadequate facilities such as websites and unsatisfactory training of knowledge transfer in methodology workshops, variability in journals' format, and failure to provide the list of research results' users	seventh	<b>31</b>
	5. Failure to establish communication networks, for example regular meetings, with research consumers to offer results	fourth	<b>51</b>
	6. Failure to assess knowledge transfer activities by researchers of the organization	third	<b>55</b>
	7. Failure to plan for assessment of the results' application by the users	first	<b>59</b>
	8. Lack of required structure or human resources for knowledge transfer	fifth	<b>40</b>
Promotion of evidence application	1. Failure to support for or involve in decision making for using the research results	first	<b>65</b>
	2. Failure to conduct sufficient training programs for services' providers and decision makers, such as evidence-based medicine or evidence-based decision making	second	<b>40</b>

## DISCUSSION AND CONCLUSION

Based on the results of this study, SKUMS had 73%, 60.5%, 15.5%, and 31.5% acceptable performance in respectively knowledge transfer, knowledge generation, research question, and promotion of evidence application, meaning this university is in progress in areas of knowledge transfer. Therefore, policy-makers and planners of SKUMS must reflect on the management of knowledge transfer to enhance the assessed indices as 30% of the universities, according to the research, have failed to make progress in knowledge transfer (Nedjat *et al.*, 2009b). As similar studies have not been published in our country so far, there are some limitations on comparisons and discussions. Knowledge management (KM) helps us to publish, learn, and renew new knowledge. Today, knowledge is the most important asset and the greatest advantage of many organizations. However, the most important and most complex problem in today's highly variable organisations is to collect, store, recycle, search in, distribute, and retrieve the knowledge. Utilization of knowledge is a subject that has already been of interest to scientists. During the last two decades, increase in volume of the information in organizations and the necessity of applying them in organizational decisions effectively have led to emergence of a phenomenon called KM (Asefzadeh and Fozounkhah, 2005). Researchers have recognized four key factors contributing to the emergence of KM: transition from the era of financial capitals' dominance to intellectual capitals' rule; extraordinary increase in the volume of knowledge, its electronic storage and hence increased access to it; change of populations' age pyramid; and the risk of losing institutional knowledge thanks to the retirement of employees and increased specialization of the activities. KM activities were initially focused on the organizations' information systems, but the attention was diverted to other units in light of the skills and expertise of staff (Piri and Asefzadeh, 2006). To date, six strategies have been offered for KM: knowledge strategy as a business strategy, intellectual capital management strategy, responsibility strategy for individual knowledge capitals, knowledge generation strategy, knowledge transfer strategy, and customer-oriented knowledge strategy (Nedjat *et al.*, 2009b; Ahghari *et al.*, 2009). The importance of knowledge in today's world is in such a way that in any curriculum vitae assessment, presentation of research papers in scientific circles is addressed. The regulation on faculty members' promotion considers the number of research articles published in journals with valid indexations as one of the promotion criteria. This confirms the promotion of research status in the country. A study

found that 79% of the reasons for selecting the title of research were not related to the needs of decision-makers and only 13% addressed research audience and, which are some common problems in SKUMS as well, needing more attention (Estabrooks *et al.*, 2006). In another study, 12.2% of the published articles on health programs in Iran had clear message and audience for knowledge transfer, which suggests that the status of knowledge transfer in SKUMS is better compared to other universities across the country. Besides, a study in Tehran University of Medical Sciences showed that only 19.5% of the researchers attained the required score of knowledge translation. Comparably, this status is better in SKUMS (Nedjat *et al.*, 2009a).

It is important to note that the results of a research project are usually sent to the audience only through the publication of articles, and appropriate measures (e.g. knowledge translation) are not taken to transfer research results to the actual audience of the research and make them applicable. Consequently the conducted research, in practice, are not propitiously and suitably exploited for meeting the country's requirements in research, health, and major decision makings. Currently the researchers should be invited to utilize the conducted research and make efforts in this respect through addressing research-derived knowledge translation activities in regulations on promotion and specifying scores to these types of activities (Nedjat *et al.*, 2009b). A study carried out in Golestan University of Medical Sciences showed that only 6 (5.8% of) projects considered knowledge transfer activities. In this regard, SKUMS had a better status (Nedjat *et al.*, 2009a). According to the findings of our study, lack of familiarity with and failure to understand consumers' needs and preferences were the key problems of knowledge transfer in SKUMS, which is consistent with other studies (Estabrooks *et al.*, 2006; Nedjat *et al.*, 2009b; Ahghari *et al.*, 2009). As articles are not usually available to decision makers on time, writing articles does not seem to be a satisfactory measure to have the knowledge transferred, which has been one of the major weaknesses of transferring knowledge in the present study as well. Therefore, a mechanism must be adopted in order for research project results, if they enjoy acceptable authenticity, to be accessible to audience. This has also been noted in other studies (Ahghari *et al.*, 2009). Among the weaknesses observed in the process of knowledge transfer in SKUMS was deficiency in the exploitation of research that is also consistent with the findings of other studies. It could be possibly explained by SKUMS' structure and lack of full integration of education and research that needs to be addressed.

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