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Psychometric of the Self-Assessment Tool of Academic Researchers Knowledge Translation Activities

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Abstract

Nowadays, it is essential that researchers operationalize their research evidence with the help of knowledge brokers in proper communication with stakeholders and make such pieces of evidence applicable. The present study aims at psychometric of the self-assessment tool of academic researchers' knowledge translation activities and explaining the role of academic librarians in this process. This study was a methodology research. A questionnaire was designed and its psychometric properties including design, face validity and content validity, and internal and external reliability of the construct were measured. During the first and second stages of the research, the initial version of the questionnaire with 52 items was designed. During the third and fourth stages, the self-assessment section of knowledge translation activities was developed as the main structure of the questionnaire in four components, namely research question, knowledge creation, knowledge transfer, and promotion of using evidence. In the following, the psychometric analysis of the final version of the questionnaire (with 46 items) was approved for all the items with the impact score of 4.48, content validity index of 0.92, content validity ratio of 0.85, Cronbach's alpha coefficient of 0.91, and correlation coefficient of 0.93. The results of this study indicated that the developed questionnaire enjoys proper psychometric properties for the self-assessment of knowledge translation activities of academic researchers by considering the role of librarians in facilitating this process.

Keywords: Psychometric, Self-assessment Tool, Knowledge Translation, Academic Researcher, Knowledge Transfer.

Introduction

"Knowledge-based development" is one of the pillars of Iran's 20-year vision. However, at present, there is no scientific ideal relationship between what we know and what we practice in such a way that the executive activities of the health system are rarely backed by scientific research (Sedighi, Majdzadeh, Nejat, & Gholami, 2008).

The pieces of research carried out in this domain indicate that the mechanisms of authorship and publication of scientific articles and research reports have been such that no success has been achieved in terms of the transfer of research findings to the audience at the right time (Asayesh, et al., 2014; Ferdosi & Alavi, 2011; Hosseini, Habibkhoda, Falahi, Shokooh, & Danaei, 2010; Kermanshahani, 2013 ; Nejat, et al., 2008). In this sense, a concept, entitled "knowledge translation", is at play that has an active participation as an effective strategy in promoting the adoption and application of research findings.

According to the Canadian Institute of Health Research (CIHR), knowledge translation refers to "the exchange, production, and application of research findings by means of a complex system of communication between researchers and users of knowledge. In other words, knowledge translation is the "accelerator of knowledge cycle in converting knowledge into practice" (Sedighi, et al., 2008). Knowledge translation begins from the stage of research question and response whose completion requires the active participation of researchers as producers of knowledge and decision-makers. In addition, knowledge translation will have a key role in the dissemination of research findings to the audience via comprehensible a language (Majdzadeh, 2013).

Various models have been proposed on the translation and exchange of knowledge so far, which are distinguished from each other through the definitions and the degree of emphasis they have on different aspects of knowledge translation. The current study has been carried out in line with the model designed by Sedighi, et al. in 2008, i.e. "knowledge translation cycle" (Fig. 1). According to this model, it is possible to design a framework for the identification research in universities and to implement necessary interventions, such as the role of academic librarians as knowledge brokers in order to reduce the gap between science and research. This model has been composed of five main sections, namely knowledge creation, knowledge transfer, research utilization, question transfer, and context of organization (Sedighi, et al., 2008).

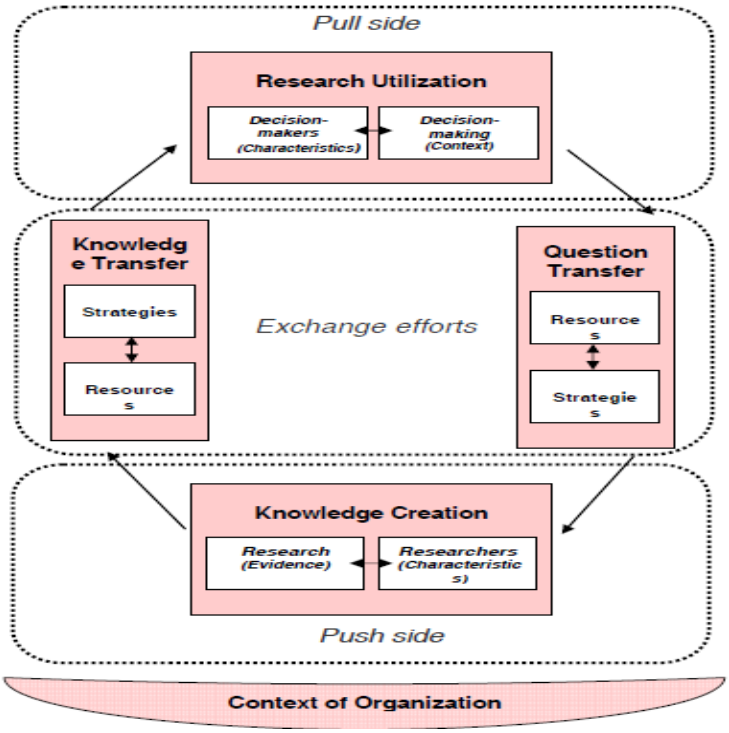

Figure 1. The model of "knowledge translation cycle"

According to this model, the academic researchers having the responsibility of knowledge push in knowledge translation process are required to take advantage of necessary skills at individual and organizational levels (Armstrong, 2014). However, the main problem is that researchers need to have a complementary role to accelerate their knowledge translation activities given the lack of time. This way, they can fulfill the information needs of decision-makers and knowledge users. Undoubtedly, knowledge brokers, relying upon their skills, will be able to provide the grounds for relations and interactions among researchers and knowledge users through the conduct of necessary measures.

Today, librarians are regarded as the knowledge brokers who are able to adjust and complete the stages of research question and knowledge transfer in knowledge translation by creating a bridge between researchers and information users (Wilkinson, Pollard, & Farquhar, 2010). At the beginning of research, these knowledge brokers conduct a needs analysis on the population of knowledge consumers, including policy-makers, decision-makers, doctors, patients, people, and the like and, accordingly, they will be able to identify research priorities and provide adequate resources for the population of researchers. On the other hand, they can deal with the management and dissemination of the results at the end of research by means of the techniques and tools at their disposal. Therefore, the use of a tool will be necessary to identify barriers to the knowledge translation from the stage of research question to promotion of using evidence. Below, a number of national and international research projects in this domain will be mentioned.

Nejat, Sedighi, Gholami & Majdzadeh (2008) embarked on the development of a self-assessment tool of knowledge translation particular to research organizations, including universities, colleges, and public and private research centers in order to make the model of knowledge translation cycle applicable. Their designed questionnaire consisted of 50 items and four domains which generally aimed at identifying barriers to knowledge translation. The validity of the questionnaire has been assessed only through content validity whereas its reliability has

been assessed via intraclass correlation coefficient (ICC) and Cronbach's alpha at four levels separately. The following reliability coefficients have been reported for the tool components via ICC and Cronbach's alpha methods, respectively: 0.94 and 0.79 for research question, 0.87 and 0.70 for knowledge creation, 0.90 and 0.86 for knowledge transfer, and 0.48 and 0.27 for promotion of using evidence. Moreover, Nejat et al. (2008) reviewed the assessment criteria of faculty members and investigated the degree of research-based knowledge transfer in Tehran University of Medical Sciences. All the research projects of Tehran University of Medical Sciences that had been registered from 2004 to 2006 constituted the research sample. It is notable that the final reports of these research projects had been submitted. The designed tool was, indeed, the questionnaire that assessed researchers' performance on both active and passive knowledge transfer activities through 13 items. The content validity and reliability of the items in two dimensions of repeatability and internal consistency were reported to range from 0.69 to 0.72 via ICC and from 0.63 to 0.76 via Cronbach's alpha. Jabari, Madhoshi & Falah (2012) designed the questionnaire of the factors effective in knowledge sharing behavior among faculty members and assessed the psychometric properties of the questionnaire. The mentioned construct has been designed in two sections, demographic characteristics and items on knowledge sharing behavior within 36 items. At first, the face validity of the scale was assessed from the perspective of 23 faculty members both qualitatively and quantitatively. Then, the content validity of the questionnaire was examined via qualitative and quantitative methods where the opinions of 8 experts were used in the qualitative; however, in the quantitative method, content validity index and content validity ratio along with the assessment of 20 experts' opinions were used. The construct validity of the above-mentioned questionnaire was calculated through factor analysis on a 92-faculty-member population. In the final stage, the internal consistency of the questionnaire was calculated via Cronbach's alpha method where the coefficient 0.75 was confirmed. In this regard, Babalhavaeji, Tajedini, Nooshinfard & Hariri (2013) developed the self-assessment tool of knowledge translation related to humanities scholars through the qualitative method of phenomenology. The research construct has been designed in the form of 32 items and five main areas. The statistical population of the study included 21 faculty members of humanities departments of the universities under the coverage of Ministry of Science, Research, and Technology. In fact, these departments have been researched most frequently. In addition, the validity of the questionnaire has been measured in two stages by member checking and peer examination.

Decision-makers and users of health services have some missions from knowledge creation to the application of results on their shoulder in order to complete the research activities of organizations and maintain the knowledge translation cycle. To this end, the Canadian Health System Research Foundation (CHSRF) (2005) designed a self-assessment tool for the organizations implementing or using research findings; this tool examines the status of decision-making or knowledge users in four levels of acquisition, access, adaptation, and research application by means of 40 items. The validity and reliability of this construct were confirmed during a research project by Kothari, Edwards, Hamel & Judd (2009) through group discussion and test-retest methods in research centers.

In addition to the above-mentioned items, numerous tools have been designed in the field of knowledge management to evaluate the level of knowledge management activities and give an introduction to knowledge translation; some of them will be discussed in the following. Newman & Conrad's Knowledge Management Questionnaire (2000) was designed in the form of 21 items and four components and its validity and reliability were assessed through several studies. For example, Haghighat Monfared & Hoshyar (2010) did so to examine the relationship between

organizational culture and knowledge management among managers and experts at the Iranian Oil Industry. Lawson's Knowledge Management Questionnaire (2003) has been developed to investigate the relationship between organizational culture and knowledge management in the form of 24 items and six components while its content validity has been proven by the measurement of the correlation between the components of the questionnaire and its reliability has been approved by such researchers as Kouchaki, Ghaumi & Hasan Moradi (2012) who reported the Cronbach's alpha coefficient of 0.92 and Golgoni & Najafzadeh (2014) who reported the Cronbach's alpha coefficient 0.93.

Reviews of the related studies reveals that no studies have been carried out so far on the psychometric analysis of Knowledge Translation Questionnaire in the field of Health and Medical Education. Hence, the present study aims at psychometric of the self-assessment tool of academic researchers' knowledge translation activities and explaining the role of academic librarians in this process.

Method

The current study is a methodological research that was conducted in 2016 to design the self-assessment questionnaire of knowledge translation activities and assess its psychometric properties. The questionnaire designed and assessed the validity and reliability of the construct in the four following stages as mentioned in fig.2 via Waltz, Strickland & Len's method (Waltz, Strickland, & Lenz, 2010). In the following part, these stages have been explained.

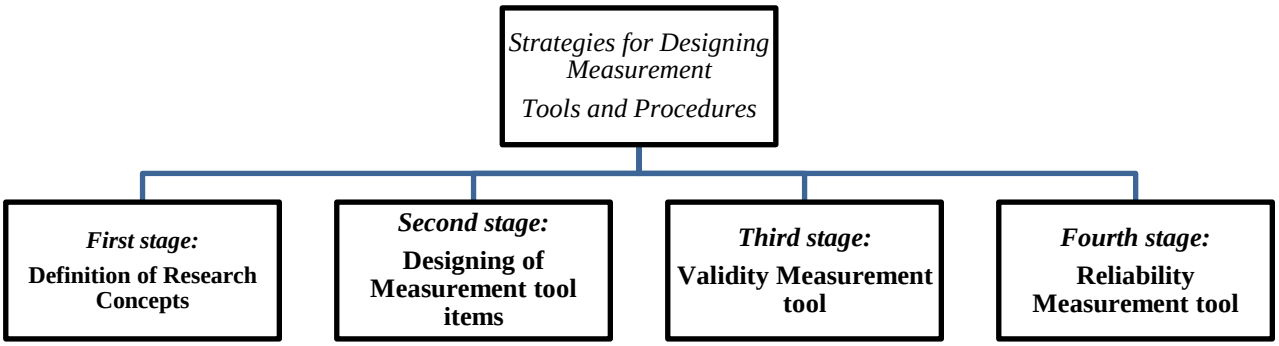

Figure 2. Designing & Psychometric Measurement Tools

First stage: With the purposeful study and review of the literature related to knowledge translation process in educational environments, the concept of academic researchers' knowledge translation activities and academic librarians' role were defined in this process according to the model of knowledge translation cycle.

Second stage: With the study and review of the tools pertaining to knowledge management, knowledge transfer, and knowledge translation in research-educational institutions inside or outside the country (Babalhavaeji, et al., 2013; CHSRF, 2005; jabari, et al., 2012; Lawson, 2003; Nejat, et al., 2008; Nejat, et al., 2008; Nonaka & Takeuchi, 1995; Waltz, et al., 2010) and considering the research findings in the first stage, the initial version of the questionnaire was designed with 52 items in two sections of active and passive activities of knowledge dissemination and self-assessment of knowledge translation activities.

Third stage: After item construction, the validity of the tool items was evaluated via face validity and content validity. It is noteworthy that validity refers to the conception that the questions and scale included in the measurement tool measures the variables and subject matter

truly and accurately. In other words, the validity of a tool depends on the extent to which it can truly measure what is desired to be measured (Drost, 2011). To conduct this part of the research, 10 researchers of Bushehr University of Medical Sciences, as the target group, were interviewed in order to determine the qualitative face validity of the questionnaire where these researchers commented on the objective structure, level of difficulty, the disproportion level, and the ambiguity of questions. Then, within two weeks, the questionnaire was submitted to 10 academic researchers who had a history of research activities in the context of university in order to assess the quantitative face validity of the questionnaire in the form of impact score. For the reduction of the number of items and elimination of inappropriate items, each of the items was scored on a five-point Likert scale (not important, somewhat important, moderately important, and very important) and the impact score of the items was calculated as per formula 1:

$$\text{Impact score} = \frac{\text{Sum of the frequency repetition of score by the target group}}{\text{the number of member in the target group}}$$

Formula 1. Calculation of the impact score of questionnaire items

If the impact score of each item is higher than 1.5, the face validity of the tool is approved. For the evaluation of content validity, qualitative and quantitative methods were used. The qualitative content validity of the research tool was investigated within two weeks in consultation with the supervising professor and 10 experts. In fact, the harmony of the tool content with the research objectives was evaluated. However, for the quantitative content validity of the scale, the questionnaire was assessed through the opinions of 10 experts within two weeks in the form of content validity ratio and content validity index. The necessity of the items was calculated using content validity ratio in a three-point spectrum, i.e. necessary, useful but not necessary, and not necessary according to formula 2:

$$\text{Content Validity Ratio} = \frac{\text{The number of necessary responses in each item} - \frac{\text{the total number of participants}}{2}}{\frac{\text{the total number of participants}}{2}}$$

Formula 2. Calculation of the content validity ratio of the questionnaire items

The condition for the retention of each item is that the score of content validity ratio should be larger than 0.62 based on Lawshe table (Table 1) (Lawshe, 1975).

Table 1
Minimum values of content validity ratio in one-way tests introduced by Lawshe for the appropriateness of content validity (1975)

The minimum value of content validity ratio	The number of experts (participants)
0.99	5
0.99	6
0.99	7
0.75	8
0.78	9
0.62	10

The minimum value of content validity ratio	The number of experts (participants)
0.49	15
0.42	20
0.37	25
0.33	30
0.31	35
0.29	40

In order to complete the validity process of the questionnaire, the simplicity, clarity, and relevance of items were measured through content validity index on a 4-point Likert scale as per formula 3:

$$\text{Content validity index} = \frac{\text{the number of the experts who have assigned score 3 or 4 to the item}}{\text{the total number of experts}}$$

Formula 3. Calculation of content validity index of questionnaire items

It is noteworthy that the first condition for the confirmation of the content validity of scales is that the value of content validity index should be higher than 0.7 (Mohammadbeigi, Mohammadsalehi, & Aligol, 2015).

Fourth stage: The reliability or dependability can be defined as a degree of similarity of results over time and under the same conditions and methods, which is measured via repeatability and reproducibility(DeVon, et al., 2007). At this stage, reliability was assessed both at internal and external levels. Cronbach's alpha was used to determine the internal consistency of the questionnaire and test-retest method was employed to determine the external consistency of the questions by means of Pearson correlation coefficient (Mohammadbeigi, et al., 2015).

Results

As it was mentioned earlier, according to the results obtained from the sources relating to knowledge translation process from production to the applicability of the evidence, the initial version of the questionnaire was designed with 52 items in two sections of active and passive activities of knowledge dissemination and self-assessment of knowledge translation activities. The self-assessment section of researchers' knowledge translation activities was developed as the basic structure of the questionnaire within four components, namely research question, knowledge creation, knowledge transfer, and promotion of using evidence. It is noteworthy that some questions were added to the end of each of the four components in order to investigate the role of academic librarians as knowledge brokers in the facilitation and acceleration of knowledge translation process from the perspective of researchers.

During the determination of the qualitative face validity of the tool, the section of active and passive activities of knowledge dissemination (13 items) was removed due to its overlap with items of knowledge transfer in knowledge translation process in consultation with the supervising professor and considering researchers' opinions. Only the items were added to the component of knowledge transfer that were required to be responded to and were distinguished from the other items. Finally, the research tool was designed in the four mentioned components with the aim of the self-assessment of researchers' activities. Then, the impact score of each item was investigated to assess the quantitative validity of the questionnaire. All the items obtained the high score of 1.5; therefore, none of them were removed or altered. At the end, the mean value of all items' impact scores was reported to be 4.48. At the next stage, the qualitative content validity of the tool was

examined to measure the consistency degree of the tool content with the research objectives. In this way, the overlapping items were merged. In addition, a number of questions relating to the status of knowledge translation in research organizations were modified to the questions pertaining to the status of knowledge transfer among researchers as per the researchers' views. Then, the questions pertaining to stake-holders in three components of research question, knowledge transfer, and promotion of using evidence were separated in two categories of decision-makers and research users and one item was added to each of the mentioned components. In this way, the number of the questionnaire items reached 48 items. However, the content validity ratio was reported equal to 0.6 for all the items in the section of quantitative content validity except for four items that were re-evaluated. Two items pertained to the component of research question whose content validity ratios were obtained equal to 0 and 0.4; hence, both of the items were excluded the final items and the number of the tool items was reduced to 46 items. However, one item with the score of 0.2 out of knowledge creation components and another item with the score of 0.4 out of knowledge transfer component were re-evaluated by five experts and changes were made to them. Both items were confirmed with the score of one and, eventually, the mean score of content validity ratio was obtained equal to 0.85 for the questionnaire items. Afterwards, the content validity index of all the items was obtained greater than 0.7; at the end, the mean value of the content validity index of the tool items was obtained equal to 0.92.

After the measurement of face and content validity of the questionnaire, two methods of internal reliability (Cronbach's alpha) and external consistency (test-retest and Pearson correlation coefficient) were used to confirm the scientific reliability of the tool. In this way, 20 questionnaires with 46 items were presented to researchers eligible for the research and the internal reliability of the tool was confirmed with Cronbach's alpha coefficient of 0.91 for all items, as shown in Table 2.

Table 2
Cronbach's alpha coefficients for the components of academic researchers' knowledge translation activities

No.	Components	Cronbach's alpha coefficient	Cronbach's alpha for the total items
1	Research question	0.68	0.91
2	Knowledge creation	0.77	
3	Knowledge transfer	0.79	
4	Promotion of using evidence Total	0.81	

In addition, the external reliability of the tool was confirmed through test-retest method within a one-week interval on a sample of 10 eligible researchers where the Pearson correlation coefficient of 0.93 was obtained for 46 items.

It should be noted that the final questionnaire has been inserted in Appendix 1 with 46 items that are scored on a five-point Likert scale. If the participants select the option "Yes, it is always the case", they will receive score 5. On the other hand, if they select the option "No, it is not the case at all", they will receive score 1. It is noteworthy that all the questions in the questionnaire are positive and, as it was mentioned, some items were added to the end of each component in order to evaluate the role of academic librarians in knowledge translation process (Table 3).

Table 3
The items included in the questionnaire for academic researchers knowledge translation activities and the role of librarians

No.	Components	The number of items	Items' numbers related to knowledge translation activities	Items' numbers related to the role of librarians
1	Research question	8	1-6	7 & 8
2	Knowledge creation	12	1-7	8-12
3	Knowledge transfer	18	1-12	13-18
4	Promotion of using evidence	8	1-4	5-8
	Total	46	29	17

Therefore, considering the minimum score of one and the maximum score of five for each item, the minimum total score of the questionnaire equals 29 and its maximum score equals 145. Moreover, the minimum score of the role of librarians was considered 17 and the maximum score of their role was considered 85 where each item has been divided into four ranges, namely unfavorable, somewhat favorable, favorable, and very favorable.

Discussion

The present study aims at psychometric of the self-assessment tool of academic researchers' knowledge translation activities and also explaining the role of academic librarians in this process. The results of the study showed that the designed tool enjoys appropriate reliability and validity for the self-assessment of knowledge translation activities among academic researchers and for explaining the role of academic librarians in this process.

The main significance of this study was that its tool was designed based on knowledge translation cycle model in four components, namely research question, knowledge creation, knowledge transfer, and promotion of using evidence. Knowledge translation cycle model structure is not limited to a linear process but it has been experiencing an ongoing process during a research cycle via the identification of research priorities and operationalization of the generated evidence among the manufacturers and executive organizations that use knowledge. Accordingly, the employment of this tool in research-educational environments seems useful and necessary due to the dynamic nature of research activities and systematic structure of universities. Then it can be claimed that most of the research conducted in this area has focused on one of the components of knowledge translation process, such as knowledge creation, knowledge transfer. Also, the role of knowledge brokers had been forgotten in completing the translation process, and knowledge sharing or has only assessed the general status of organizational knowledge management. On the other hand, according to the mentioned model, the designed tool contains such a specified and purposeful structure that researchers can respond to the questionnaire items by spending the least possible time. In this regard, Nejat, et al. (2008) first designed the knowledge translation tool specific to research institutes based on knowledge translation cycle and in line with the four components of the current research with the difference that the reliability of the components of promotion of using evidence has been reported to be smaller than 0.6 and, thereby, it is not reliable. In addition, they only evaluated the status of research institutes in order to provide the grounds for the initiation of knowledge translation, and the performance of researchers as executive agents has not been studied. In another study done by Nejat, et al. (2008), researchers' performance, as one of the dimensions of knowledge translation, has been examined in the form of knowledge translation activities both through active and passive methods of assessment. However, in Jabari, et al.'s research (2012), the initial questionnaire was designed only in the form

of 36 items and, then, the components were developed by conducting the construct validity using factor analysis. In the development of the self-assessment tool of knowledge translation related to humanities scholars, Babalhavaeji, et al. (2013) have addressed five components, namely research question, research findings, knowledge transfer, knowledge sharing, and knowledge application. In the same way, Newman & Conrad's Knowledge Management Questionnaire (2000) contains four components of knowledge generation, saving and reviving, sharing, and application. Lawson (2003) assessed the situation of knowledge management in order to investigate its relationship with organizational culture in five areas of knowledge acquisition, knowledge organization, knowledge storage, knowledge dissemination, and knowledge application. In addition, the CHSRF (2005) has designed a self-assessment tool of knowledge translation and has examined status of knowledge users in four levels of acquisition, access, adaptation, and research application. As it was mentioned above, the aforementioned studies have limited themselves to some domains of knowledge translation or have assessed the status of research activities from the perspective of knowledge management.

Among the other features of the present tool, one may refer to the fact that it can be used in other quantitative research with academic populations by means of quantified techniques or it can be used, in a general sense, to compare the status of knowledge transfer or translation between two populations. From among the mentioned studies, Nejat, et al. (2008), Babalhavaeji, et al. (2013), and the CHSRF (2005) have developed the knowledge translation tool through a qualitative approach in such a way that each one of the researchers can remove some statements from the questionnaire and add or add some statements to it in line with his/her research objectives. However, other studies have attempted to quantify the questionnaire by confirming the validity and reliability of the tool in line with the current research.

Another strength of the current research constructs is that it investigates the structure of knowledge translation activities from the perspective of academic researchers and faculty members, staff, and students. Since many obstacles and difficulties in the process of knowledge translation are tangible for researchers due to the role they have in research activities, their views and suggestions, as the main elements of the knowledge producing organizations, will be undoubtedly applicable and practicable at the individual level in order to improve the available research conditions. Nejat, et al. (2008), Jabari, et al. (2012), and Babalhavaeji, et al. (2013) reported the results in line with those of the present study in terms of the kind of target population with the difference that these studies have not regarded all components of knowledge translation fully. In contrast, in another study, Nejat, et al. (2008) designed the self-assessment tool of knowledge translation for research organizations; in the same way, the CHSRF (2005) developed the self-assessment questionnaire of knowledge translation with administrative organizations or knowledge users as the target population.

With the review of the related research, it can be inferred that no study has been conducted to design and the knowledge translation questionnaire in the field of Health and Medical Education and assess it psychometric properties. Therefore, due to the approval of content and face validity in both qualitative and quantitative methods at both internal and external levels, the current study can be fruitful in similar communities, particularly in the context of universities for other researchers in order to maintain the steady flow of knowledge. In this regard only Jabari, et al. (2012) designed the questionnaire pertaining to the factors influencing the knowledge sharing behavior (as a portion of knowledge translation process) and analyzed its psychometric features through the measurement of three types of validity, i.e. face, content, and construct validity and the confirmation of the internal consistency of the construct (Cronbach's alpha coefficient of

0.75). In contrast, the other studies have only assessed the face validity and content validity of the tool via qualitative methods.

The role of academic librarians as knowledge brokers in the continuity of academic researchers' knowledge translation cycle is one of the features of the questionnaire of this study that has made a distinction between it and those of the other similar studies. Academic librarians provide the grounds for relations and interactions between researchers and stakeholders with the aim of the possibility of mutual, cultural, and working understanding of goals and, eventually, operationalizing the evidence obtained from research through effective communication. In this research, the role of librarians have been evaluated in assessing the conditions for knowledge of research priorities, the introduction of a group of decision makers and knowledge users, the teaching of the use of information resources, the introduction of knowledge transfer skills, and the collaboration in the availability of results by using electronic services.

Conclusions

The results of this study demonstrated that the designed tool takes advantage of good psychometric properties for the self-assessment of academic researchers' knowledge translation activities. It should be noted that the present tool provided the conditions for the awareness and identification of the obstacles and problems ahead of researchers at the individual level. To this end, research organizations, especially medical universities embark on monitoring and controlling the activities of researchers, reducing the negative points, promoting the researchers' level of knowledge and ability, designing appropriate policy, and providing the required circumstances to achieve the goals of knowledge translation. Indeed, the objective of research organizations is to advance the goals of the national health system.

The most important limitation of the current tool is that it has been designed in the form researchers' of self- assessment questions. Due to bias in responding, researchers may introduce their research activities better than the status quo. Therefore, researchers should be included with a specific entry criterion. In addition, researchers should be given the assurance that the information provided by them will remain strictly confidential.

Suggestions

In the following of the present study, it is suggested that another type of validity, such as construct validity be assessed at the regional level in future studies in order to complete the process of psychometric analysis of the tool. In this way, the tool will benefit from a higher degree of comprehensiveness in the evaluation of knowledge translation in research-educational settings.

Declarations

We received ethical code: IR.BPUMS.REC.1395.6 from the deputy of research and technology of the university provided the research fund.

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Appendix 1: The final version of the Self-Assessment Tool of Academic Researchers Knowledge Translation Activities

No.	Research question	CVI	CVR	Impact score
1)	I am aware of the University's priorities.	0.9	1	4.8
2)	I conduct my research in line with the University's research priorities.	0.9	0.8	4.6
3)	I am familiar with the decision-makers (managers, policy-makers) of my research findings.	0.7	0.8	4.5
4)	I am familiar with the users (clinicians, pharmaceutical and medical companies, researchers, patients, and people) of my research findings.	0.7	0.8	4.5
5)	I have access to the research grants of the university.	0.9	0.8	3.8
6)	In carrying out my research projects, I usually use the resources (human, financial, and equipment resources) outside of my organization.	0.9	0.6	3.8
7)	University librarians are involved in the introduction of stakeholders of research findings to researchers.	0.9	0.6	4.5

8)	University librarians provide the terms for awareness of research priorities with the help of webs, databases, and the like.	0.9	0.8	4.9
No.	Knowledge creation	CVI	CVR	Impact score
1)	I carry out my research with the participation of decision-makers on research findings.	0.9	0.8	4.5
2)	I carry out my research with the participation of users of research findings.	0.9	0.8	4.5
3)	I do my research with such quality that is applied to the stakeholders.	0.9	1	4.4
4)	I do my research with the aim of being updated and responsive to the stakeholders' needs.	0.9	1	4.9
5)	To create actionable messages, I try to provide a high level of evidence for my own research through the conduct of systematic review studies, activities of production of clinical guidelines, and the like.	0.8	1	4.7
6)	In doing research, I observe the proper time interval between "the identification of the subject of research" and "the research initiation".	0.9	0.8	4.3
7)	I set the proper time interval between the "end of the research" and "presentation of the results in the form of a report" (the timely presentation of the results of applied projects, especially in clinical trials that are directly related to public health).	1	1	4.5
8)	Through participation in workshops held by the librarians (for the purpose of familiarity with the updated information resources), I will conduct my research more consciously and purposefully.	0.9	0.2	4.5
9)	Librarians are involved in the process of producing quality research tailored to the needs of the stakeholders through the introduction of printed books and journals.	0.9	0.8	4.4
10)	With the introduction of non-print journals and books, websites, databases, search engines, and other electronic resources, the librarians are involved in the production process of quality research tailored to the needs of the stakeholders.	0.9	0.8	4.7
11)	Through cooperation in the development of the resource search strategy at the production process, librarians may facilitate and accelerate the research.	1	0.8	4.9
12)	With the introduction of highly-cited articles and resources, especially in research areas, librarians are involved in the selection of resources for knowledge creation.	0.9	0.8	4.8

No.	Knowledge transfer	CVI	CVR	Impact score
1)	In each research, I prepare a list of decision-makers of research findings.	0.9	0.8	3.9
2)	In each research, I prepare a list of users of research findings.	0.9	0.8	3.9
3)	I am familiar with the theme "research-based knowledge transfer".	1	1	4.7
4)	I present my research findings in the form of actionable messages appropriate to the audience.	0.9	0.6	4.6
5)	I enjoy the "communication skills" necessary (in interaction with the group of stakeholders) for the knowledge transfer.	0.9	1	4.4
6)	I publish the results of my research in national and international journals.	0.9	1	4.8
7)	I present the results of their research at conferences, seminars, and domestic and foreign calls.	1	1	4.8
8)	I publish my research findings in non-academic journals (such as magazines or newspapers of public interest).	0.9	0.8	4.2
9)	I will send my research findings to users if they ask for it.	0.9	1	4.5
10)	I will send my research findings to users without the need for any request on part of users according to the initial assessment.	0.9	0.6	3.9
11)	I prepare and send my research findings in an appropriate language of users (such as simple writing in the form of pamphlets, brochures and the like for patients, specific texts for managers, practice reports for clinicians and laboratory colleagues, specific reports to the industry managers or specific reports for academics).	0.9	0.8	4.5
12)	I present the final research findings to journalists, radio, and television for publication in the media or participation in the interview.	0/9	1	4.1
13)	I notify the users of my research findings during the meetings held in coordination with university librarians to notify users to convey.	0.9	0.4	4.1
14)	I make use of the guidance of the librarians who are familiar with the skills of knowledge transfer in order to meet the stakeholders' satisfaction.	0.9	0.6	4.7
15)	Librarians cooperate with researchers in selecting the proper journal for publishing papers by means of evaluation and the introduction of journals.	1	1	4.7
16)	Librarians are involved in the introduction of conferences, seminars, and meetings at national and international levels.	1	1	4.8
17)	Librarians introduce the tools and methods of communication like social networking sites, news groups, and video conferencing to provide research findings.	0.9	0.8	4.5

18)	University librarians cooperate with stakeholders via the transfer of the research message in an easier and faster language through electronic services (such as the placement of the results in organizational websites) within the transfer of research-based knowledge.	0.9	0.8	4.4

No.	Promotion of using evidence	CVI	CVR	Impact score
1)	I undertake my research projects with the aim of producing evidence that is applied in health decisions.	1	1	4.5
2)	I examine the extent to which decision-makers make use of research results in order to get the final feedback.	0.8	0.8	4.7
3)	I examine the extent to which users make use of research results in order to get the final feedback.	0.8	0.8	4.7
4)	I identify the potential barriers to users' behavioral change in using research findings.	0.8	0.8	4.3
5)	University librarians cooperate with me in the production of evidence (systematic review studies and clinical guidelines).	1	1	4.8
6)	University librarians facilitate the use of research evidence for the research stakeholders by making accessible the reports and providing the possibility of the dissemination of research results.	0.9	0.8	4.6
7)	With the provision of electronic services, particularly through the digital library of the university, librarians are involved in promoting the use of reports and increased use of research findings.	1	1	4.7
8)	With the introduction of new tools, such as social networks, decision support systems (DSS), and the like, librarians are involved in promoting the use of research evidence.	0.9	0.8	4.6