

Investigating the Factors Affecting the Motivation of Nurses for Sharing Knowledge Online

Abstract

Background: Considering the importance of Knowledge Sharing (KS) among nurses, this research aimed to investigate the factors influencing the motivation of nurses for sharing knowledge online. **Materials and Methods:** This research was a questionnaire survey. The statistical population included all 1403 nurses working in the hospitals of Hamadan, Iran, and the sample size was estimated to be 302 participants. The collection tool was a questionnaire adopted from the research by Nguyen *et al.*, and its reliability and validity were measured and confirmed. Structural equation modeling was used to test the research hypotheses using PLS 3. **Results:** Of the studied nurses, 78.15% use the Internet “moderate” to “very much.” Self-efficacy ($\beta = 0.24, t = 5.03, p < 0.001$), reputation ($\beta = 0.54, t = 10.96, p < 0.001$), and reciprocity ($\beta = 0/09, t = 2.081, p = 0.04$) had a direct and positive impact on the online KS behavior of nurses. In addition, the top management support and individual innovation capability did not have a moderating role in the effect of reciprocity, reputation, and self-efficacy ($p > 0.05$) on the online KS of nurses. **Conclusions:** This study helps to understand that reciprocity, reputation, and self-efficacy are the factors influencing the increase of online KS among nurses, and it is necessary to support the creation of online space for facilitating reciprocal relationships and interpersonal interactions of nurses to increase their online KS.

Keywords: Iran, knowledge management, motivation, nurses, online systems

Introduction

Health-care organizations have realized the value of Knowledge Sharing (KS) as a backbone of the knowledge management for innovation and enhancing the quality of care and patient safety.^[1,2] KS is a process through which knowledge is transferred in disparate forms from one person, group, or organization to another,^[3] which causes the development of new ideas among the employees.^[4] KS between health-care workers, especially nurses, reduces medical errors and improves the health-care process.^[5] Today, online tools and information and communication technologies have provided more opportunities for employees to communicate in interorganizational and extra-organizational communities^[6] and share their ideas and knowledge with 24/7 access to information. However, the concern about losing competitive advantage and threatening job security can prevent employees from Online Knowledge Sharing (OKS).^[1] So, it is necessary

to provide some conditions to increase the motivation of nurses to share their knowledge online.

In previous studies, various factors have been investigated to identify the factors influencing employees’ motivation for sharing knowledge. Hew and Hara,^[7] in a qualitative study, found seven motivators for KS, including collectivism, reciprocity, technology, personal gain, altruism, respectful environment, and interest of the seeker. In addition, Nguyen,^[8] in a literature review, identified the influencing factors of OKS, including management supports, social norms, and trust; but she points out that self-efficacy and rewards (extrinsic rewards and intrinsic rewards) are the most prevailing determinants of KS. The review of the studies conducted on the role of these factors in KS among different occupational groups including nurses showed that some of these factors have been less investigated and the results of these studies are not consistent. For instance, Kaewchur and Phusavat^[9] highlighted the effect of

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self-efficacy on KS; but Tan^[10] did not confirm it and stated that much self-efficacy may hinder KS within organizations. Rafeian-Isfahani *et al.*,^[5] in their study on nurses, did not confirm the relationship between reciprocal benefits and KS intention, while the results of other studies have supported the effect of reciprocity on KS.^[11-13] So, the question arises whether or not factors such as self-efficacy, reputation, and reciprocity actually have an effect on OKS.

However, studies indicate the variation in the impact of self-efficacy, reputation, and reciprocity on KS behavior.^[8] So, the question arises that what factors can cause these variations. In a few studies, the moderating role of top management supports and individual innovation capability as organizational and personnel factors have been investigated. However, their results are not consistent. Unlike the study of Nguyen *et al.*^[1] the studies of Akhavan *et al.*^[13] and Aulawi *et al.*^[14] did not support the moderating role of individual innovation capability. In addition, Lin^[11] found that organizational rewards and top management did not have the expected significant effect on employees' attitudes and behavioral intentions regarding KS; but Nguyen *et al.*^[15] and Nguyen and Malik^[16] suggested that top management supports are factors influencing people's motivation for sharing their organizational knowledge.

The literature review shows that few studies have been conducted on the influence of the factors of self-efficacy, reputation, and reciprocity, with the moderating role of top management supports and individual innovation capability on nurses' OKS. The only study in this field is the research by Nguyen *et al.*,^[1] which was conducted on the workers of telecommunications companies. In the case of nurses, the literature review shows that few studies have investigated the motivations for OKS. For instance, Shehab *et al.*^[17] examined the moderating role of self-efficacy between four selected individual factors of head nurses. In addition, Rafeian-Isfahani *et al.*^[5] investigated the relation between the intrinsic and extrinsic motivations and KS intentions among nurses. So, considering the inconsistency in the results of the studies on the effects of the mentioned factors of KS and the lack of research on OKS among nurses, we aimed to investigate the effect of reciprocity, reputation, and self-efficacy and the moderating role of top management support and individual innovation capability on OKS among nurses.

Materials and Methods

This study was conducted using a cross-sectional survey method in 2022. The research population comprised 1403 nurses working in the hospitals of Hamadan University of Medical Sciences in Hamadan city, Iran. Assuming 95% confidence level, the power of the test to be 80%, the proportion of nurses population of 50% ($p = 0.5$), an effect size of 0.05, and considering the finite population correction factor (=75%), the sample size was estimated to be 302 nurses. Since the statistical population of the research was nurses working in five different

hospitals, we used the stratified and random sampling method to choose the appropriate samples. Therefore, for each hospital, the sample size of nurses was calculated in proportion to the number of nurses working in that hospital. Nurses who were working full time in Hamadan city hospitals were included in this research, and participants' unwillingness or disagreement or incomplete answers were the exclusion criteria of the research with code number: IR.UMSHA.REC.1401.574.

The collection tool in this study was a questionnaire adopted from Nguyen *et al.*'s^[1] research. This questionnaire contains 23 items (five items for self-efficacy, four items for reputation, four items for reciprocity, three items for individual innovation capability, three items for top management support and four items for online KS). The construct measures in the present research were stabilised on a 5-point Likert-type scale, ranging from 1 = "strongly disagree" to 5 = "strongly agree."

To analyze the reliability and validity of measurement tools and models, coefficients of Composite Reliability (CR), and Cronbach's alpha (for reliability), Average Variance Extracted (AVE) and Fornell and Larcker criterion to evaluate convergent and discriminant validity were calculated for total samples [Tables 1 and 2].

As can be seen in Table 1, the calculated value of Cronbach's alpha for research variables ranges from 0.89 to 0.99, which demonstrates confirmation of reliability of the questionnaire. In addition, CR value as a measure of internal consistency of an indicator loading on the latent variable was calculated to be from 0.92 to 0.990, indicating appropriate internal reliability of the measurement model. AVE values as indicators of convergent validity were calculated to be higher than 0.50, indicating good and acceptable convergence validity of measures. Discriminant validity was measured by Fornell and Larcker criterion. As seen in Table 2, the values of the square root of AVE on the principal diameter are higher than the values in each row, which indicates that there is discriminant validity between the constructs. Finally, we used descriptive statistics including frequency and frequency percentage using Statistical Package for the Social Sciences version 25 to describe demographic data and structural equation modeling to test hypotheses using SmartPLS 3. The quality of structural model and hypothetical relationships between constructs were measured based on the coefficients of determination

Table 1: The values of construct measurement

Variable	Cronbach's alpha	CR*	AVE**
Self-efficacy	0.89	0.92	0.70
Reputation	0.92	0.94	0.80
Reciprocity	0.99	0.99	0.96
Individual innovation capability	0.99	0.98	0.95
Top management support	0.98	0.99	0.97
Online knowledge sharing	0.91	0.94	0.79

*CR=composite reliability,**AVE=average variance extracted

Table 2: Discriminant validity assessment of constructs (Fornell and Larcker criterion)

	*OKS	**TMS	***IIC	Reciprocity	Reputation	Self-efficacy
Self-efficacy	0.84					
Reputation	0.49	0.89				
Reciprocity	0.60	0.47	0.98			
IIC	0.06	0.14	0.07	0.98		
TMS	0.07	0.11	0.03	0.72	0.98	
OKS	0.57	0.71	0.51	-0.06	0.09	0.89

*OKS=online knowledge sharing, **TMS=top management support, ***IIC=individual innovation capability

(R^2), Goodness of Fit (GOF), standardized path coefficients (β), and t -value significance. The measurement model in the standardized coefficient mode shows that the factor loadings of all indicators are above 0.7, indicating their acceptability.

Ethical consideration

This study has been ethically approved by the Ethics Committee of Hamadan University of Medical Sciences with code number: IR.UMSHA.REC.1401.574. After getting the code of ethics, permission was issued to distribute the questionnaires in hospitals. The researchers first obtained permission from the respondents for their participation in the study. After obtaining consent from the respondents to participate, the researchers explained the objectives of the study and then assured them that the confidentiality of the data and their anonymity would be maintained. Respondents were free to withdraw from the study at any time.

Results

The results of descriptive statistics for demographic characteristics are presented in Table 3. The majority of respondents (79.80%) were female, 41–50 years old (40.40%), with bachelor's degree (68.21%). Most of the nurses (79.13%) had a work experience of less than 15 years. Moreover, 78.15% of the respondents use the Internet "moderate" to "very much" and 21.85% use the Internet "low" and "very low."

Structural model and key findings

Coefficient of determination (R^2) as a predictive accuracy criterion of the model measures the changes of the endogenous variables based on the effect of all exogenous constructs. This value is calculated for endogenous constructs, but for exogenous constructs, it is calculated as zero. Values 0.7, 0.3, and 0.1 can be considered as large, medium, and low degree, respectively.^[18] The value obtained for OKS ($R^2 = 0.58$) and the average of this value ($=0.58$) were greater than 0.3, which means it had medium to high predictive power. GOF indicator was calculated to assess the overall fitness of the model. The obtained value for GOF ($=0.63$) shown in Table 4 indicates relatively strong overall model fitness.

Finally, the hypotheses were tested by calculating standardized path coefficients (β) and t -value. The results are presented in Table 4 and Figure 1. In Figure 1, the blue

circles are related to the variables self-efficacy, reputation, and reciprocity as independent variables and OKS as a dependent variable; Also the green circles indicate the moderating effects of individual innovation capability and top management support on the impact of independent variables. The effects of each of these moderating variables are given in Table 4 with standardized path coefficients. The yellow rectangles show the items of each of the considered variables along with the factor load values. A path coefficient that is standardized with values between -1 and $+1$ indicates the direct effect of a construct on another construct assumed to be a significant effect. Values close to -1 indicate strong negative effect of the endogenous variable, and values close to $+1$ indicate its stronger positive effect. If the obtained path coefficients between constructs are greater than 0.6, it implies that the predictive impact of endogenous construct is stronger than that of the exogenous construct. If this value is between 0.3 and 0.6, the effect is considered to be moderate, and if it is less than 0.3, it is considered a weak predictor. Regardless of the value of the path coefficient, the significance of the relationship between the constructs depends on the t -value. If the t -value exceeds 1.96, it demonstrates the significance of the relationship between the variables and the confirmation of research hypotheses at the 95% confidence interval level.

According to data presented in Table 4, self-efficacy ($\beta = 0.24$, $t = 5.03$), reputation ($\beta = 0.54$, $t = 10.96$), and reciprocity ($\beta = 0.09$, $t = 2.08$) significantly affected the OKS behavior of nurses. According to the β -value, the reciprocity and self-efficacy have a relatively weak effect, but the effect of reputation on OKS of nurses is relatively strong. The results showed that individual innovation capability does not have a moderating role in the effects of self-efficacy ($\beta = -0.03$, $t = 0.49$), reputation ($\beta = -0.002$, $t = 0.04$), and reciprocity ($\beta = -0.03$, $t = 0.51$) on OKS of nurses. In addition, the results indicated that top management supports could not moderate the effect of self-efficacy ($\beta = 0.003$, $t = 0.05$), reputation ($\beta = 0.03$, $t = 0.57$), and reciprocity ($\beta = -0.05$, $t = 0.89$) on OKS of nurses.

Discussion

Nowadays, the development of Internet and cyberspace has made organizations carry out many of their activities in this environment. The findings showed that 78.15% of

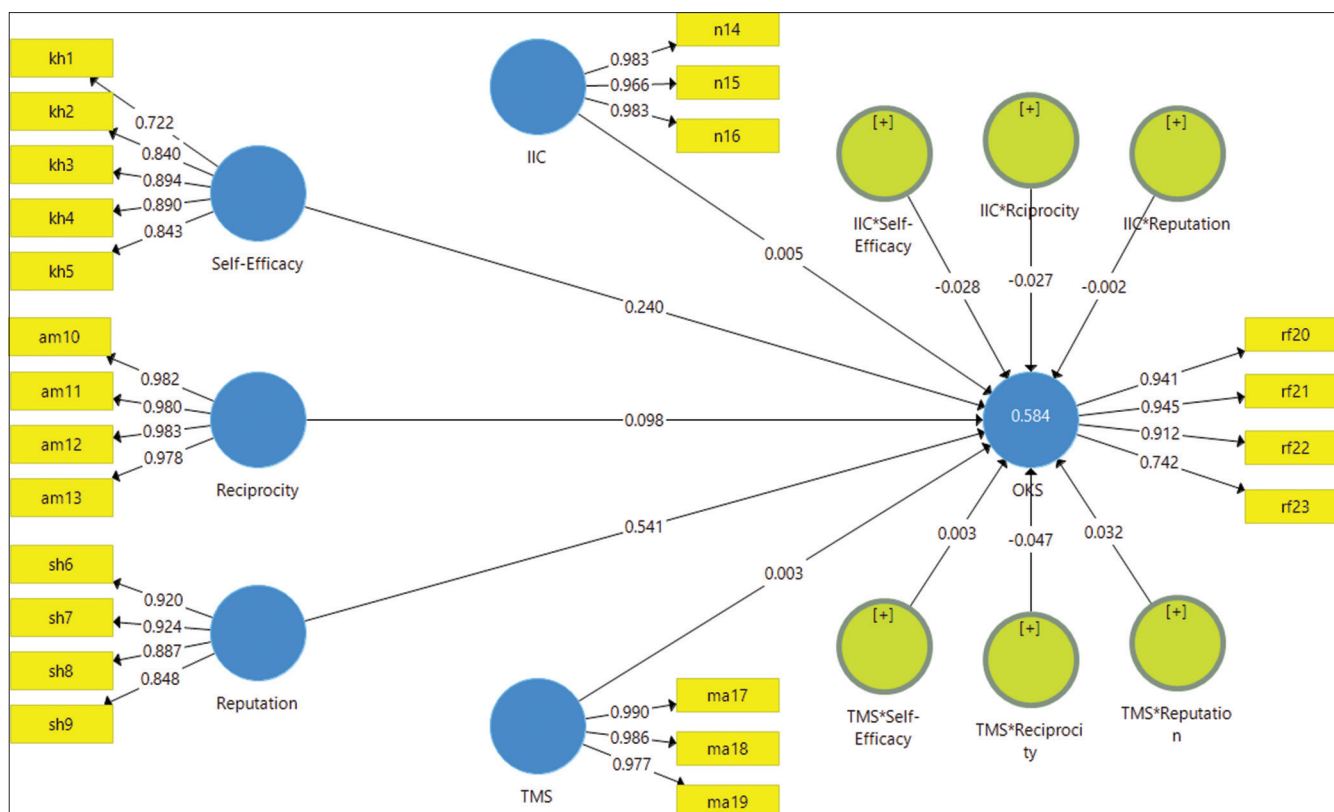


Figure 1: The SmartPLS output of structural model assessment

Table 3: Demographic characteristics

Demographic characteristic		n (%)
Gender	Male	61 (20.20)
	Female	241 (79.80)
Age	<30 years	93 (30.79)
	31–40	122 (40.40)
	41–50	77 (25.50)
	>50 years	10 (3.31)
	Education	Bachelor’s degree
	Master’s degree and PhD	96 (31.79)
Work experience	<5 years	55 (18.21)
	6–10	72 (23.84)
	11–15	112 (37.09)
	16–20	39 (12.91)
	>20 years	24 (7.95)
Internet usage	Never	1 (0.33)
	Very low	15 (4.97)
	low	50 (16.56)
	Moderate	165 (54.64)
	Much	57 (18.87)
	Very much	14 (4.64)
Total		302 (100)

the nurses use the Internet moderately to very much. This means that the tendency to use cyberspace is high among nurses. So, they can be encouraged to do some activities, such as KS in this environment. To motivate and encourage nurses to share knowledge online, identifying the affecting

factors is necessary. In this study, some of these factors were investigated as main and moderating factors. The results revealed that self-efficacy, reputation, and reciprocity as independent variables (modeled in this study), in general, are predictors for OKS as a dependent variable ($R^2 = 0.58$ and the average of this value = 0.58). This result was consistent with the findings of Nguyen *et al.*^[1] that confirmed a positive association between self-efficacy, reputation, and reciprocity and OKS. In the same vein, Rafieian-Isfahani *et al.*^[5] indicated knowledge self-efficacy, reputation, and reciprocity as intrinsic rewards that have an effect on the KS of nurses. But these results were not consistent with the findings of some studies. A study by Tan^[10] did not confirm the effect of reputation on KS. This may be because some employees have valuable skills and knowledge and tend to keep them to themselves. Although Nguyen *et al.*^[1] and Lin^[11] confirmed the effect of self-efficacy on the KS behavior, they reported the effect to be in a U shape. They stated that this factor has an effect on KS to some extent, and when employees feel that their knowledge is much greater than the knowledge of others, they hesitate to share it with others. Self-efficacy is described as individuals’ trust in their abilities to accomplish a goal which can be useful for others.^[19] Considering this, it can be justified that low self-efficacy due to the lack of self-confidence and ability leads to less KS. On the contrary, too much self-efficacy can lead to nonsharing of knowledge due to spending more time and energy by some employees and their lack of interest in sharing knowledge with other employees. This shows that

Table 4: Test of relations between variables

Hypothesis	Path coefficients (β)	t^*	p	Supported?
H ₁ Self-Efficacy -> OKS	0.24	5.03	<0.001	Yes
H ₂ Reputation -> OKS	0.54	10.96	<0.001	Yes
H ₃ Reciprocity -> OKS	0.09	2.08	0.04	Yes
H _{4a} ** IIC×Self-Efficacy -> OKS	-0.03	0.49	0.62	No
H _{4b} IIC×Reputation -> OKS	-0.002	0.04	0.97	No
H _{4c} IIC×Reciprocity -> OKS	-0.03	0.51	0.61	No
H _{5a} TMS×Self-Efficacy -> OKS	0.003	0.05	0.96	No
H _{5b} TMS×Reputation -> OKS	0.03	0.57	0.57	No
H _{5c} TMS×Reciprocity -> OKS	-0.05	0.89	0.37	No

**T*-test. **a, b and c are sub-hypotheses of each of the main hypothesis. OKS=Online Knowledge Sharing, IIC=Individual innovation capability, TMS=Top Management Support

there may be an optimal limit of self-efficacy that results in the highest degree of KS, and the reason for the weak effect of self-efficacy on OKS behavior may be related to this issue.

Intrinsic rewards (reputation and reciprocity) or nonmonetary encouragers are considered more important than extrinsic rewards in motivating employees for sharing knowledge online.^[16] Reputation can help a person to gain and maintain a position in a society. According to social exchange theory, people interact with each other to gain reputation and respect. Employees will share knowledge if they realize that their reputation may be improved.^[20] Reputation in KS means that people believe that they can enhance their social position through KS. According to the results of this research, the nurses have a great desire to share knowledge online due to the increase of their reputation among their colleagues. These results were also confirmed by Chang *et al.*,^[21] Nguyen *et al.*,^[1] and Rafieian-Isfahani *et al.*^[5] In justifying the great effect of reputation on OKS, it can be said that with increasing reputation, employees tend to maintain this level of reputation and therefore show a great desire for OKS. The findings showed that reciprocity increases nurses' OKS, although this effect was not strong. This result has been supported by Nguyen *et al.*,^[1] Lin,^[11] and Shehab *et al.*^[17] Reciprocity or mutual benefit implies that if someone does a favor to someone, she/he expects to receive the same or more favor from the same person.^[22] For example, based on the norm of reciprocity, everyone is more willing to share knowledge if they can receive valuable knowledge from others.^[21] This result was not supported by Rafieian-Isfahani *et al.*^[5] In justifying this inconsistency, it can be argued that the expectation of receiving valuable knowledge in the online environment by nursing colleagues is not sufficiently high.

The findings of this research showed that the individual innovation capability does not have a moderating role in the effects of reputation, self-efficacy, and reciprocity on the nurses' OKS. This result aligned with the finding of Akhavan *et al.*^[13] It seems that employees' KS behaviors increase their innovative behaviors, and in fact, innovation is considered as a consequence of OKS, not influencing OKS. But the result was not consistent with Nguyen *et al.*^[1] as they believe that

it affects how employees are positioned in the organization and perceive the costs and benefits of OKS.

Finally, the present study did not support the moderating role of top management supporting the relationship of self-efficacy, reputation, and reciprocity with OKS among nurses. Although it seems reasonable that top management support provides conditions for increasing KS, and some studies such as Amayah,^[12] Nguyen *et al.*,^[15] and Nguyen and Malik^[16] support it, the moderating role of top management support was not confirmed here, which is consistent with Lin,^[11] who found organizational rewards and top management did not have the expected significant effect on employees' attitudes and behavioral intentions regarding KS. In explaining this result, it can be mentioned that first, the nursing profession deals with human health, and the spiritual dimension is a priority over the material and organizational dimensions of the profession for nurses. As a result, they will not refuse to take any action to increase the quality of health care, including OKS apart from top management support. However, in government organizations such as government hospitals, extrinsic rewards and management support are less than in private organizations and this makes top management support in private organizations have a greater impact on KS and in government organizations, top management support does not have an impact on KS.^[16]

This research has limitations that need to be considered. This research was conducted on a small population including nurses working in the hospitals of a single city, Hamadan, Iran. To expand the study, nurses working in different cities that may have cultural differences can be examined in future research. In addition, a limited number of factors influencing KS were examined and it is necessary to consider other personal and cultural factors, especially in the online environment, in future research.

Conclusion

Considering the consequence of KS among nurses in health-care organizations, this study was conducted to investigate the factors increasing the motivation of OKS among nurses. The results of this study confirmed that self-efficacy

is an effective factor for increasing nurses' self-confidence to participate in the OKS process. So, managers of health-care organizations can consider training workshops to increase the self-efficacy^[23] of nurses and provide a platform for online KS to increase innovation in hospitals. This study also confirmed the positive effect and importance of reciprocity and reputation in increasing OKS. In addition, the results showed that individual innovation capability is not a moderating factor in the relationship between OKS and self-efficacy, reputation, and reciprocity. Innovation is a consequence of KS, which can be increased by increasing KS in the organization. So, health-care organizations should know that nurses share knowledge, especially those with high innovation ability, to increase their reputation and be recognized as an expert in their organization. Moreover, top management support was not confirmed as a moderating factor, but the support of managers can have a direct role in increasing OKS among nurses. So, creating a system where nurses can share knowledge and monitor the relevance and usefulness of shared knowledge can highlight the importance of KS. Nurses can also see that their organization values their efforts in KS. Finally, this study can contribute to knowledge management literature, especially KS, in the online environment and develop the theory of social exchange.

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Conflicts of interest

Nothing to declare.

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