

ENHANCING NURSING MANAGER'S AWARENESS ABOUT KNOWLEDGE MANAGEMENT THROUGH AN EDUCATIONAL PROGRAM

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Abstract

Knowledge management is the ability to avert an abstract theory into something tangible that can be used to enhance efficiency in an organization. Knowledge management is very important for collaboration and sharing of knowledge so that optimal output of the healthcare service is realized. **The study aimed to:** enhance nursing manager's awareness about knowledge management through an educational program. **Design:** Quasi experimental research design was utilized to conduct this study. **Setting:** The study was conducted at Beni-Suef University Hospital. **Subject:** Consist of a convenience sample (60) of nursing managers. **Data collection:** One tool was used to collect necessary data; Knowledge Management Questionnaire Sheet. **Results:** This study showed that there was a highly statistically significant difference in total knowledge management level pre, immediate post and follow up applying knowledge management program among the studied nursing managers. **Conclusion:** Nursing manager's awareness about knowledge management had been improved after conducting knowledge management program. **Recommendations:** This study recommended with affording information technology with the optimal standard to implement knowledge management with consistent maintenance in the hospitals, training knowledge management professionals who are capable of leading knowledge management initiatives in their organizations and further investigation is needed to identify factors affecting knowledge management.

Keywords: Educational program, Knowledge management, Nursing managers.

INTRODUCTION

A healthcare organization relies on information on curing patients, providing care and health satisfaction. Knowledge is divided into tacit knowledge and explicit knowledge. Tacit knowledge cannot be transferred to others because it only resides in an individual mind as it is a result of personal experience. Explicit knowledge is easy to share or communicate in varied forms. Additionally; explicit knowledge can be created, written, documented, and conveys through a communication mode (**Mahdi & Madlool, 2021**). Knowledge management (KM) can be viewed as converting data into information and forming information into knowledge. Also KM seen as a framework for enhancing the organization's knowledge infrastructure, or a tool set for providing the right knowledge to the right people in the right form at the right time. KM is largely regarded as a cyclic process including several activities; as establishing internal knowledge, gaining external knowledge, storing knowledge in documents versus storing in routines, as well as modernizing the knowledge and sharing knowledge internally and externally (**Nagendra & Morappakkam, 2022**). Nurses are knowledge intensive and primary professional in health care organizations. They are required to gain new nursing knowledge and experience that can be acquired through different net-enabled applications or internet. Nursing professionals are being asked to do more with less in such context. While the nursing care responsibilities have increased, the

IT support of nursing practices appears to lag far behind. E-health requires better access to IT applications to parse hospital-wide nursing care information and knowledge in the nursing process (**Bail et al., 2021**).

Technology is certainly a big part of the growing need for more effective knowledge management, seventy-five percent (75%) of surveyed organizations reported that creating and preserving knowledge across evolving workforces is very important for their success. In the digital, hyper connected era, organizations are gathering and bageting a “tsunami of data,” but few are able to capitalize on its full potential. According to a global survey of 1,300 business and IT executives, an average of 55 % of enterprise data goes unused; also technology has spawned new approaches of working that make the knowledge management need more urgent (**Demir, et al, 2021**).

AIM OF THE STUDY

The Study Aim Was To Enhance Nursing Manager's Awareness About Knowledge Management Through

1. Assess knowledge of nursing managers regarding knowledge management before and after applying educational program about knowledge management.
2. Design educational program about knowledge management for nursing managers.
3. Implement educational program about knowledge management for nursing managers.
4. Evaluate the effect of knowledge management educational program on nursing manager's awareness regarding knowledge management.

Research Hypotheses

1. It was hypothesized that there was a highly statistical significant difference between nursing manager's awareness related to knowledge management before and after applying knowledge management educational program.

METHODOLOGY

Research Design

Quasi experimental research design with one group pre and posttest assessment was utilized to conduct this study.

Study Setting

The study was conducted at Beni-Suef University Hospital; it is an educational hospital with a bed capacity more than 400 beds includes many specialties.

Study Subjects

The study subject included all the available nursing managers (Bachelor and master degree) (n= 60) in Beni-Suef University Hospital who was presented at the time of data collection.

Type Of Sampling

Convenient sample was used to select the study subject.

TOOLS OF DATA COLLECTION

Knowledge Management Questionnaire Sheet

The tool was developed by the researcher based on review related literature (**Sanguankaew & Vathanophas Ractham, 2019, Karamitri et al., 2020, and Feenstra, 2022**) and consisted of two parts:

Part 1: Personal data: this part included personal characteristics of nursing managers as age, gender, position, educational qualifications and years of experience).

Part 2: Knowledge Management Questionnaire Sheet: this part used to assess awareness of nursing managers about knowledge management before and after applying knowledge management educational program. It included (54) items divided into 12 dimensions (perception =5 items, information technology = 4, intrinsic motivation =4, extrinsic motivation =4, synthesis of knowledge = 5, sharing of knowledge = 5, knowledge application = 4, knowledge protection = 4, cooperation =3, leadership =3, culture =10, and (barriers = 3 items that is **a reversed item***)).

Scoring system: each knowledge management item was rated on 3 point likert scale ; for positive items ranged from 1 for disagree, 2 for neutral and 3 for agree and for negative items (reversed item of the barrier dimension) ranged from 1 for agree, 2 for neutral and 3 for disagree.

- **Satisfied knowledge management level: > 60%**
- **Unsatisfied Knowledge Management level: ≤ 60%**

Validity of the Tool

Validity of the tool was done namely face validity and content validity. The tool was translated into Arabic and tested by a group of five experts specialized in nursing administration from different four universities; Ain Shams University (one professor), Menoufia University (one professor), Tanta University (one professor) and Helwan University (one professor and one assistant professor) through an opinionative sheet to measure validity of the tool and the necessary modifications were done accordingly.

Reliability of the Tool

Reliability for the utilized tool was tested to determine the extent to which the items of the tool are inter-correlated to each other. The Cronbach's alpha model is one of the most popular reliability statistics in use today and considered as a model of internal consistency that used to estimate of reliability of test scores. Reliability of Knowledge Management Questionnaire for nursing managers by both Cronbach's alpha and half split test was (0.938& 0.928) respectively. Statistical equation of Cronbach's alpha reliability coefficient and half split normally ranges between 0-1.

Ethical Considerations

The research approval was obtained from Faculty of Nursing ethical committee of Helwan University before starting the study, an approval was obtained from the director of Beni-suef University Hospital. Informed consent was sought and obtained from each participating subject prior to date collection, they were informed about the purpose and expected outcomes of the study and that the study is harmless and their participation is voluntary and they have the right to withdrawal from the study at any time without reason. They also were assured that, anonymity and confidentiality will

be guaranteed, as well as gathered data will be used for the research purpose only. Ethics, values, culture and believes will respected.

Pilot Study

The pilot study was carried out on (10%) of the total sample size (6 nursing managers) to test applicability and clarity of tool and time needed to complete it. Total time needed to complete tool was ranged between (20:25) minutes. No modifications were done so participants in the pilot study were included in the study sample.

Field Work

The purpose of the study was simply explained to the participants who agree to participate in the study prior to any data collection. Field work started actually at the beginning of November 2021 to the end of October 2022). After securing the official approval from the hospital for conducting the study, the researcher met the nursing director of the hospital to determine the suitable time for data collection.

The researcher collected data by herself through meeting nursing managers and was presented at all time during fulfilling the questionnaire form to answer any questions. Also the researcher checked the completeness of each filled sheet to ensure the absence of any missing data.

Process of Educational Program

The educational program of this study was conducted on three phases: assessment, designing & implementation, and evaluation phases.

First Phase: Assessment

The researcher was developed tool for data collection, met the director of Beni-suef University (both medical and nursing) to explain the aim and process of the study, collected all necessary information about nursing managers as (numbers, qualifications, departments, gender, age and years of experience working in the hospital). Conducted the pilot study on 10% of the total nursing managers (6) from the beginning of November 2021 to the beginning of December 2021(one month), additionally the researcher begin to collect data from beginning of December 2021to end of January 2022 (2 months) by using developed tool with the study participants in the study setting considered their available time without interrupting their daily work and after explaining the purpose of the study to them. The researcher scheduled the visits to the hospital with the training department and under support of nursing director of the hospital as following; the researcher visited the hospital 3 times per week on day shift; each visit was ranged from 4:5 hours (from 9am to 2pm). Total number of nursing managers selected per week was; (20) nurse managers\week. The researcher began to assess the awareness of nursing managers related to knowledge management using the knowledge management questionnaire (pre-test) before implementing educational program. The time needed to complete the tool ranged between (20:25) minutes.

Second Phase: Designing & Implementation

The researcher in this phase designed and implemented an educational program about knowledge management for the nursing managers. Based on the pre-test results, the general objectives of the knowledge management educational program was to enhance nursing manager's awareness about knowledge management.

Knowledge management educational program was designed to be consistent with the nursing manager's educational needs. This phase started in the beginning of February 2022 to the beginning of May (three months).

The researcher divided nursing managers into (3) groups, each group of them included (20) nursing managers under supervision and support of Beni-suef University Hospital nursing director considering their daily work load.

The knowledge management educational program implementation was through three weeks as following ; each group from the three groups of nursing managers took 3 days every week to conduct the program content, every day included (2sessions), every session took (2hours) with 15 minutes for break time. Different teaching methods were used in conducting the educational program as; lectures, group discussion and brain storming. Also media used as, power point, data show, white board and program booklet that was prepared by the researcher for nursing managers which helped them to revise and refresh program content taken during sessions. At the end of each session nursing managers informed about the next session time.

Third Phase: Evaluation

The aim of this phase was to evaluate the effect of applying the educational program on nursing manager's awareness about knowledge management by using questionnaire that was provided to nursing managers immediately after completion the program.

- ❖ **Immediate evaluation:** after completion of the educational program, the knowledge management questionnaire had been given to the nursing managers to assess their awareness about knowledge management. Immediate evaluation post program was started on the beginning of May 2022 to the mid of June 2022.
- ❖ **Follow up post program:** reassessment was done after three months post conducting the program. The same tool that used in immediate evaluation post program was given to the nursing managers. Follow up evaluation post program was started on the beginning of September 2022 to the end of October 2022 (two months).

III. Administrative Design

Approval to carry out this study was obtained from the Dean of the Faculty of Nursing Helwan University and Director of Beni-Suef University Hospital to conduct the study. Individual oral consent was also obtained from each nursing manager to participate in the study

IV. Statistical Design

Data entry and analysis were performed using SPSS statistical package version 25. Categorical variables were expressed as number and percentage while continuous variables were expressed as (mean \pm SD). Chi-Square (χ^2) was used to test the association between row and column variable of qualitative data.

The Shapiro Wilk test has a significance value below 0.05, indicating that the data did not follow a normal distribution; therefore, nonparametric tests were used for analysis. ANOVA test was used to compare mean in normally distributed quantitative variables in more than two groups. The Kruskal–Wallis test is nonparametric tests used to

compare the mean ranks of scores and determine significant differences in mean values for more than 2 groups. Pearson correlation was done to measure correlation between quantitative variables.

For all tests, a two-tailed p-value ≤ 0.05 was considered statistically significant, P-value ≤ 0.01 was considered highly statistically significant. While p-value > 0.05 was considered not significant. Eta square (η^2) is used to measure the effect size. The referential framework for identifying the effect size for Anova-test value.

RESULT

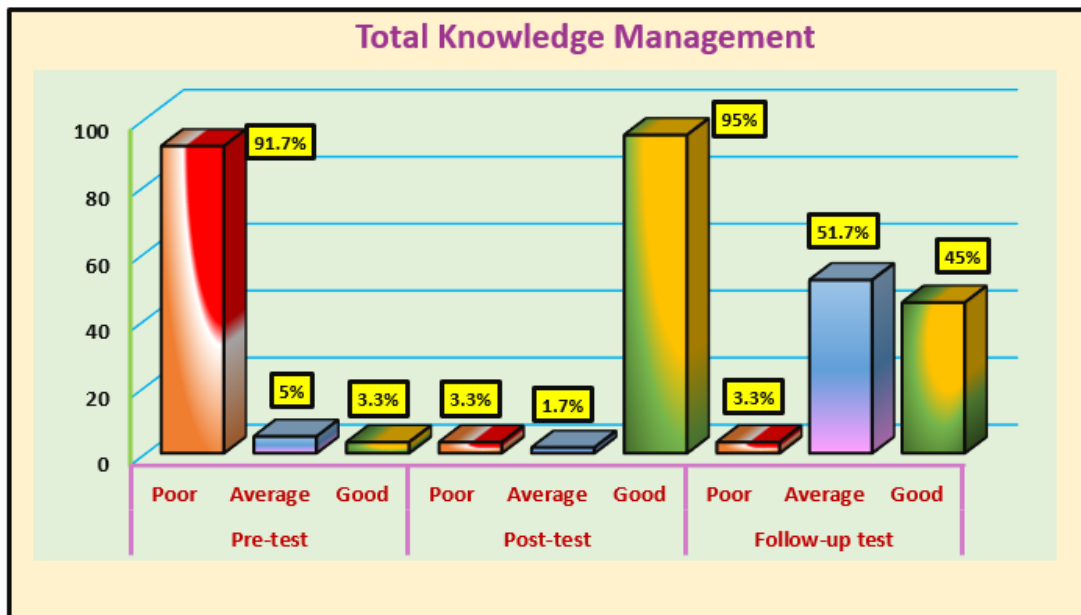
Table 1: Personal characteristics of the studied nursing managers (n=60)

Nursing manager's Characteristics		N	%	χ^2	P-Value
▪ Age (in years)	23- ≤ 28	15	25.0	3.100	0.212
	29- ≤34	26	43.3		
	≥ 35 years	19	31.7		
$\bar{x} + SD$	37.01 + 9.1				
▪ Gender	Male	11	18.3	24.0	0.000**
	Female	49	81.7		
Ratio	M to F ratio=0.2 : 1				
▪ Marital status	Un married	20	33.3	6.66	0.010**
	Married	40	66.7		
▪ Current position	Nursing director	1	1.7	148	0.000**
	Nursing director assistants	4	6.7		
	Nursing supervisors	5	8.3		
	Infection control nurses	3	5.0		
	Quality nursing staff	2	3.3		
	Head nurses	45	75.0		
▪ Nursing qualifications	Bachelor	55	91.7	41.6	0.000**
	Master	5	8.3		
▪ Year of experience	< 5 years	8	13.3	28.9	0.000**
	≥ 5 years <10 years	30	50.0		
	≥ 10 years <15 years	19	31.7		
	≥ 15 years	3	5.0		
$\bar{x} + SD$	8.58 + 3.72				

Significant $p \leq 0.05$

**Highly significant $p \leq 0.01$

Table (1): shows Personal characteristics of the studied nursing managers, it shows that 43.3% of the age range of the studied nursing managers was 29- ≤34 years old, with a mean age of 37.01 + 9.1. Moreover, the majority (81.7%) of them were female, with male to female ratio is 0.2: 1. As considering the marital status, more than two third (66.7%) of them were married. As regards education, the majority (91.7%) of the studied nursing manager were holding a bachelor's nursing degree. As concerning the Current position, about three quarter (75%) of the studied nursing managers were a head nurse. As considering, year of experience, one half (50%) of the studied nursing managers had experience ranged from ≥ 5 years to <10 years with a mean of 8.58 + 3.72



$\chi^2=194, P=0.000$

Figure 1: Comparison between total knowledge management during pre, post & three months follow up among the studied nursing managers (n=60)

Figure (1): clarifies comparison between knowledge management during pre, post & three months follow up among the studied nursing managers. It denotes, during the post-test phase, the studied nursing managers awareness about knowledge management was increased with the percentage of (95%) followed by the phase of follow-up test (45%) as compared with the phase of pre-test (3.3%). In addition to presence of difference between observed and expected values with a significant statistical difference at $\chi^2=194, P=0.000$.

Table 2: Correlation between cumulative total of knowledge management, age and years of experience among the studied nursing managers (n=60)

Socio- Demographic characteristics	Total knowledge management	
	Correlation Coefficient (r)	P- Value
• Age	0.876	0.000**
• Years of experience	0.962	0.000**

*Highly significant $p < 0.01$

Table (2): it shows correlation between cumulative total of knowledge management and socio demographic characteristics (age & years of experience) among the studied nursing managers. It indicates that, there was a highly significant statistical positive correlation between knowledge management and studied nursing managers' age & years of experience, ($r = 0.876$ & 0.962 , respectively) at $P = 0.000$.

Table 3: Effect size and η^2 of Knowledge management educational program on awareness during pre, post & three months follow up among the studied nursing managers (n=60)

Variables	Interval	Mean	SD	F Test	P value	H	η^2	Effect size
Total Knowledge	Pre-test	85.0	14.6	259	0.000***	0.864	0.746 ***	Large effect
	Post-test	134.5	9.69					
	Follow up	120.6	11.9					
	Total	113.3	24.2					

*Significant $p \leq 0.05$

**Highly significant $p \leq 0.01$

F: ANOVA Test

*Small effect size (.01)

**Medium effect size (.06)

***Large effect size (.14)

Table (3): clarifies Effect size and η^2 of knowledge management educational program on total knowledge during pre, post & three months follow up among the studied nursing managers. It calcifies that knowledge management educational program had positive large effect size on awareness about knowledge management, during pre, post & three months follow up among the studied nursing managers at $\eta^2= 0.746$. As when Eta-square value = 0.01 to < 0.06, the effect is considered weak, when it = 0.06 to < 0.14, the effect is considered medium and when it ≥ 0.14 the effect is large. Therefore, this provides enough evidence to support research hypothesis.

DISCUSSION

KM within healthcare, reflecting how the management of knowledge is just as important as managing resources. KM is the management of information and knowledge and their usage in organizational processes within the organization. KM can help in improving performance by reducing the time spent on communication, recording, and combining patient information because traditionally the information provided was often obsolete or unrecorded. This took up 33% of doctors' working hours, increased the cost and also resulted in improper medical care for the patient (Ammirato et al., 2021).

The study results showed that more than one third of the studied nursing manager's age was between 29 up to 34 years. From the researcher point of view this may be due to study sample including only the nursing managers that usually with more age than staff nurses. Also the majority of the study subjects were females and holding a bachelor's nursing degree. From the researcher point of view this may be due to nursing profession still receive females more than males despite of increasing flow of males to the profession , also nursing management position thoroughly for bachelor degree rather than technical institute. Regarding marital status more than two third of study subjects were married and about three quarters of the studied nursing managers were a head nurses and half of them had experience ranged from five to less than ten years.

The current study results were supported by (Ayanbode &Nwagwu, 2021) who studied "Collaborative technologies and knowledge management in psychiatric hospitals in South West Nigeria " and stated that more than two thirds of the study subjects were females and more than one third of them were in the age group of 30-35 years, also one third of the same study subject had from six up to ten years of working experience. Furthermore, the current study results were in contrast with (Abtayneh, 2019) who studied "The Effect of Using Expert Systems in the Implementation of Knowledge Management Processes Jordanian King Abdulla

University Hospital" and stated that more than two thirds of the study subjects were males and nearly half of them had eleven up to fifteen years of working experience

The current study result displayed that the majority of the studied nursing managers had a poor awareness regarding knowledge management pre applying the program. From the researcher point of view this may be due to work overload that act as a barrier preventing nursing managers from being updated with new trends and concepts in our profession and continuously working on their knowledge development. This study result was supported by **(Okonkwo et al., 2020)** who studied "Managerial Competencies; A survey of healthcare managers in a tertiary hospital in Calabar, south-south Nigeria" and noted that there was inadequate knowledge management in a typical tertiary hospital in Nigeria.

Moreover the current study result was in agreement with **(Belay et al, 2020)** who studied "Alignment of knowledge management process with clinical process to support evidence based decision in healthcare improvements: The case of selected Ethiopian hospitals " and concluded that there was a weak trends of KM in our sample hospitals.

The current study results showed that the majority of the studied nursing managers had a good awareness regarding knowledge management immediate post applying the program. From the researcher point of view this may be due to high level of understanding and concentration of the studied nursing managers, their ability to catch new knowledge and perception of importance of the knowledge management. Also more than half of the study subject had an average awareness regarding knowledge management three months follow up applying the program. This may be due to three months period follow up applying program that may cause studied nursing managers to forget some of program knowledge and not continuously review program content.

The current study result was supported by **(Hegazy et al, 2018)** who studied "The relationship between healthcare organization culture and Nurses' Knowledge Management" stated that the majority of the studied nursing personnel had a high level of knowledge management. Furthermore, this result was in contrast with **(Karsikas et al, 2022)** who studied "Health care managers' competence in knowledge management: A scoping review" revealed that there was a limited understanding of health care managers' competence in knowledge management

The current study results concluded that there was a highly statistically significant difference between total mean and standard deviation of knowledge scores among studied nursing managers and three level of total knowledge score (poor, average and good) of knowledge management during pre, post & three months follow up of applying knowledge management educational program. From the researcher point of view this may be due to lack of nursing managers awareness of knowledge management concept before applying knowledge management educational program as for many nursing managers the knowledge management was a new concept. Increasing nursing managers understanding and awareness regarding knowledge management dimension and items after and follow up implementing knowledge management educational program sessions because they get more explanation and understanding of this new concept (knowledge management).

The current study results revealed that there was a highly significant statistical positive correlation between cumulative total of knowledge management and studied nursing managers' age & years of experience. From the researcher point of view this may be due to the ability of the studied nursing managers to learn and concentrate

enhanced with increasing their age and years of experience as they become more knowledgeable, more interested in continue their education and have more capacity to learn.

Furthermore, the current study results were in contrast with **(Hegazy et al., 2018)** who studied "The Relationship between Healthcare Organizational Culture and Nurse's Knowledge Management" and stated that there was no statistical significant difference between studied nursing personnel according to age groups and years of experiences.

CONCLUSION

This study concluded that the majority of nursing managers had a low level of awareness related to knowledge management before applying knowledge management program, also total knowledge management scores had improved among all of them immediate post and follow up of applying knowledge management program, as knowledge management educational program had positive large effect size on total knowledge management during pre, post & three months follow up among the studied nursing managers.

RECOMMENDATIONS

Based on the previous findings, the following recommendations suggested:

1. Affording information technology with the required standard to implement knowledge management with continuous maintenance
2. Conducting educational program among faculties staff member about knowledge management
3. Further investigation is needed to identify factors affecting knowledge management

References

1. **Abtayneh, M. T. (2019)**. The effect of using expert systems in applying knowledge management processes: a field study at King Abdullah University Hospital. *Jerash for Research and Studies*, 21 (Special Issue), 137-158. Retrieved from <http://search.mandumah.com/Record/1110117>.
2. **Ammirato, S., Linzalone, R., and Felicetti, A. M. (2021)**. Knowledge management in pandemics. A critical literature review. *Journal of Knowledge Management Research & Practice*, 19(3),1-12. DOI:10.1080/14778238.2020.1801364.
3. **Ayanbode, O. F & Nwagwu, W.E.(2020)**: Collaborative technologies and knowledge management in psychiatric hospitals in South West Nigeria *Journal of Information Development*.37(1) 136–157. DOI:10.1177/0266666919895563.
4. **Bail, K., Merrick, E., Fox, A., Gibson, J., Hind, A., Moss, C., & Redley, B. (2021)**. Ten statements to support nurse leaders implement e-health tools for nursing work in hospitals: A modified Delphi study. *Journal of clinical nursing*, 30(9-10), 1442-1454. Doi: 10.1111/jocn.15695.
5. **Belay, M., Desta, A., Smithson, S., and Meshesha, M. (2021)**. Alignment of knowledge management process with clinical process to support evidence based decision in healthcare improvements: The case of selected Ethiopian hospitals. *Knowledge and Process Management Journal*, 28(11), 3-10. DOI:10.1002/kpm.1654.
6. **Demir, A., Budur, T., Omer, H. M., & Heshmati, A. (2021)**. Links between knowledge management and organizational sustainability: does the ISO 9001 certification have an effect?. *Journal of Knowledge Management Research & Practice*,21(1),1-14.<https://doi.org/10.1080/14778238.2020.1860663>.

7. **Feenstra, R. L. (2022).** Validation of a knowledge management instrument for rural maternity healthcare: A quantitative descriptive study (Order No. 29060669). Available from ProQuest Dissertations & Theses Global. (2656113396). Retrieved from <https://www.proquest.com/dissertations-theses/validation-knowledge-managementinstrument-rural/docview/2656113396/se-2>.
8. **Hegazy, M., Taie, E., & Abdelrahman, R. (2018).** The Relationship between Organizational Culture and Nurses's Knowledge Management. Master Thesis, Helwan University, Faculty of Nursing.
9. **Karamitri, I., Kitsios, F., & Talias, M. A. (2020).** Development and validation of a knowledge management questionnaire for hospitals and other healthcare organizations. *Sustainability Journal*, 12(7), 2730. <https://doi.org/10.3390/su12072730>.
10. **Karsikas, E., Meriläinen, M., Tuomikoski, A., Koivunen, K., Jarva, E., Mikkonen, K., Oikarinen, A., & Kääriäinen, M. (2022).** Health care managers' competence in knowledge management: A scoping review, *Journal of Nursing Management*. 30(5), 1168–1187. Doi: 10.1111/jonm.13626.
11. **Mahdi, D. S., and Madlool, J. K. (2021).** Impact of Healthcare Knowledge Management on The Strategic Position Of Hospitals Analytical Study. *Journal of Sciences*, 6(3), 236-249. <https://doi.org/10.20319/pjss.2020.63.236249>.
12. **Nagendra, A., and Morappakkam, S. (2022).** Influence of enablers on processes and benefits of knowledge management in closed environment: a structural equation modeling. *International Journal of Public Sector Performance Management*, 9(1-2), 25-47. <https://doi.org/10.1504/IJPSPM.2022.119825>.
13. **Okonkwo, U., Ekpeyoung, B., Ndep, A., & Nja, G. (2020).** Managerial competencies survey of healthcare managers in a tertiary hospital in Calabar, south-south Nigeria. *Nigerian Journal of Clinical Practice*, 23(7), 988–994. https://doi.org/10.4103/njcp.njcp_667_19
14. **Sanguankaew, P., and Vathanophas Ractham, V. (2019).** Bibliometric review of research on knowledge management and sustainability, 1994–2018. *Sustainability Journal*, 11(16), 4388. <https://doi.org/10.3390/su11164388>.