ORIGINAL ARTICLE

Factors Associated with Knowledge, Attitudes, and Practices of Personnel to Use Objective and Key Results (OKRs) in Thammasat University Hospital

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Background: Objective and key results (OKRs) was a strategic tool to drive the organization to achieve a goal. Goals are concomitant and come from leaders and personnel. Most hospital management studies are conducted in a qualitative approach.

Objective: To evaluate the association of knowledge, attitudes, practices, personal factor (PF), and perceived organizational support (POS) of OKRs in quantitative approach.

Materials and Methods: The present study was a descriptive study conducted at Thammasat University Hospital (TUH), Pathum Thani, Thailand between March and April 2024. Participants were TUH personnel. Self-filling questionnaires were applied and signed written informed consent after thoroughly counselled. Questionnaires consisted of POS, knowledge, attitudes, and practices questions. PF was also collected.

Results: Two hundred and twenty-one participants were recruited. Most participant (192 out of 221) were female. Three-quarters (149 out of 221) of the participants had more than ten years' experience. Eighty-six percent (192 out of 221) of the participants had an educational level equal to or higher than bachelor. Mean knowledge, attitudes, and practices of participants were 9.5±0.6, 3.9±0.4, and 3.7±0.4, respectively. PF was not associated with POS and practices. Hospital personnel with more than 20 years seniority had OKRs' knowledge less than those less than 10 years seniority (b= –0.21, p=0.04). Monthly income and work experience were significantly positive and negative associated with attitudes at b=0.17 and –0.15, respectively. POS was not associated with attitudes and knowledge. Practice was associated with POS, with statistical significance (b=0.20, p<0.001).

Conclusion: OKRs knowledge decreased with work experience. Attitude was associated with high monthly income and reverse associated with work experience. POS was significantly associated with the practice. There was no association between PF and practice, PF and POS, POS and attitude, and POS and knowledge. This study provided guidelines for recognizing organizational support in implementing OKRs and improving processes to ensure efficiency and staff involvement. Management should establish clear policies involving personnel at all levels.

Keywords: OKRs; Knowledge; Attitude; Practice; Hospital

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The operation of a hospital is far more complex than it may seem at first glance. Beneath the surface, you will find a tightly woven network of competencies, structures, protocols, and specialties, from innovative medical equipment to electrical engineering, food service, and hospitality, all before the infrastructure and organization of the medical apparatus that a hospital is built to house. Medical service does not exist in a vacuum, but instead is bound by the realities of medical guidelines, governing bodies, and the strings that come attached to funding both public and private. Government hospitals in Thailand run as not-for-profit entities but will still need to balance costs of patient treatment versus revenue from self-payment or insurance.

Objective and key result (OKR) is a management methodology employed to ensure an organization achieves goals within a desired time goal[(1)]. OKR consists of two components, objectives, and key results (OKRs). A conference of staff and leaders

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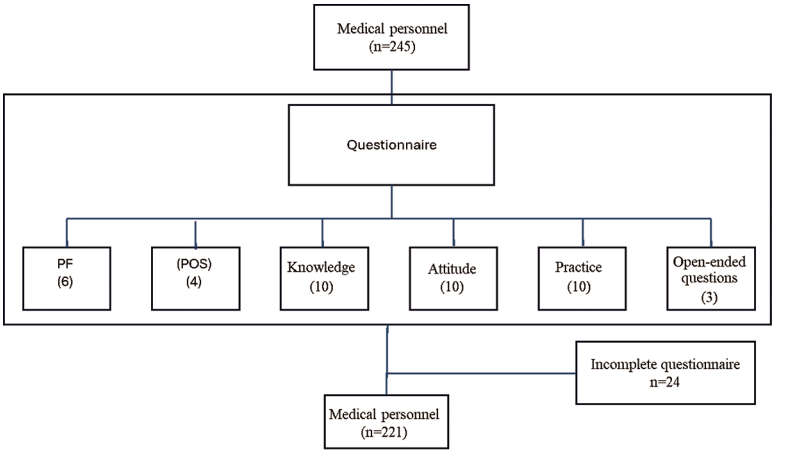

Figure 1. Study flow of knowledge, attitude, and practice by using OKRs.

PF: personnel factor, POS: perceived organization support, OKRs: objective and key results

determines the objectives. These are composed of expected results, management directives, regular evaluations, and bottom-up command. Objectives must be coherent, qualitative, motivating, and clearly assigned. Key results are proposed to be measurable and quantitative tools, with benchmarks to guide and lead to the objectives of the organization.

Key performance indicators (KPI) are a methodology that has previously been employed in hospitals. Under KPI, organizational targets are delivered in the form of leader edicts. KPIs served as metrics for monitoring and assessing the performance and impact of services, as well as functions of organization outcomes. KPI was developed to measure the achievement of an organization, including yearly evaluations of all staff. Formal control was implemented as a top-down structure based on documentation and organizational regulation. Promotions and remuneration would be heavily influenced by KPI evaluations[2].

OKR has grown in popularity among modern organizations[1]. It is believed that organizational leaders can encourage organization members to develop qualities to achieve target goals. Elite enterprises, including Intel and Google, utilize OKRs to drive organizational success[3], likely thanks to fast cycles, which are three months, for target re-evaluation.

Thammasat University Hospital (TUH) is a supra-tertiary hospital. Administration must be concerned with maintaining ahigh standards of teaching and patient care and balanced against resource management for transforming to digital supra-tertiary hospital. The present study aimed to evaluate associated factors of OKRs on knowledge, attitude, and practice (KAP) of medical personnel in TUH, as well as any connection to personal factors (PF).

Materials and Methods

The present study was conducted on a population of unit heads and staff members from TUH, Pathumthani, Thailand. The study period was conducted between March and April 2024. The study was approved by the Ethics Committee of the Faculty of Nursing, Thammasat University, Pathum Thani, Thailand (COA 082/2566). Selection criteria required personnel serving as unit heads and staff with a tenure of at least one year capable of fluent communication in Thai. Exclusion criteria included past diagnosis of anxiety or depression. Participants were oriented with a comprehensive overview of the study before signing consent released. The flow of the study is represented in Figure 1.

Qualitative data were collected via a questionnaire adapted from Andy Grove's Management Perspective[4]. The questionnaire consisted of 43 items divided among four sections. Section 1 addressed PF and perceived organizational support (POS). PF data included gender (PF1), work experience (PF2), level of education (PF3), income (PF4), job title (PF5), and OKR experience (PF6). POS data included performance (POS1), knowledge and career advancement opportunities (POS2), supportive care aspect (POS3), and recognition of work value (POS4).

The second section was focused on OKRs adaptation knowledge, employing true-false questions

scored according to Bloom's criteria. Results were classified into three levels, high at 80% or better, intermediate at 60% to 79.9%, and low at 0% to 59.9%. The third section investigated attitude and personal practices on OKRs in TUH, utilizing a Likert scale with 10 questions split between perspectives and practices. Each item ranged from one for strongly disagree to five for very strongly agree. The scoring system was calculated by the average of the score, ranging from 3.68 to 5.00, 2.34 to 3.67, 1.00 to 2.33, and classified as high, intermediate, and low, respectively. The fourth section consisted of open-ended questions soliciting individual opinions on adapting and utilizing OKRs in TUH, including success factors, obstacles, and suggestions.

Content validity index (CVI) of the Thai version questionnaire was between 0.8 and 1.0, which indicated high validity[5]. Reliability analysis of the current questionnaire was evaluated and reported using Cronbach's alpha coefficient (Kuder-Richardson, KR-20)[6].

The sample size was calculated using multi-stage sampling. At least 20 samples were needed for each independent factor. There were ten independent factors and seven hospital administrative departments. At least 200 samples were needed for statistical significance. An additional 20% for the seven hospital administrative departments was added to compensate for data loss, bringing the total to 245 needed participants. The statistical significance level for the study was set at 0.05.

The IBM SPSS Statistics, version 28.0 (IBM Corp., Armonk, NY, USA) was used for statistical analysis. PF were expressed as values in numbers and percentages. POS was presented as mean ± standard deviation (SD). Multiple linear regression analysis was used for evaluation of the relationship between PF and POS among knowledge attitude and practice in OKRs.

Results

Two hundred twenty-one participants were recruited, with the final pool being majority female (PF1) (192 out of 221). Two-thirds (149 out of 221) of the participants had more than 10 years of work experience (PF2) and almost half (102 out of 221) had four or more years' experience with OKRs implementation (PF6). Four-fifths (149 out of 221) of the participants had an education level (PF3) higher than a bachelor's degree, as shown in Table 1.

Overall, the study group's POS was classified as high level. POS1, POS3, and POS4 were also measured at high levels. POS2 was the only factor to be measured at only moderate levels. Mean KAPs regarding OKRs in TUH of participants were 9.5±0.6, 4.0±0.4, and 3.7±0.4, respectively. KAP was classified as high level as presented in Figure 2.

Overall, PF was not associated with POS. The comparison between PF and POS1, POS2, POS3, and POS4 are summarized and depicted in Figure 3. Comparison of PF to POS is presented in Figure 3. Multiple linear regression analyses of knowledge (K) and the practice (P) regarding OKRs in TUH of participants with PF and POS are presented in Table 1. Work experience (PF2) of more than twenty years was significantly associated with knowledge. However overall, POS was significantly associated with practice.

Multiple regression analysis between PF and attitude (A) could not be calculated due to the abnormal data distribution. Kendall rank correlation coefficient (Kendall's coefficient) was used to analyze KAP with PF and POS as presented in Table 2. PF had no statistical correlation with KP. PF2 for work experience had a negative relationship with attitude (b= –0.15) while PF4 for monthly income exhibited a positive relationship with attitude with statistical significance as shown in Table 2. Hospital personnel with less than 10 years of experience served as the reference group to be compared to those with 11 to 20 years or over 20 years of experience. Those with over 20 years of experience had significantly lower OKRs knowledge compared to the reference group (b= –0.21, p=0.04).

Multiple linear regression analysis between PF and knowledge showed slight differences. Personnel with 11 to 20 years of experience showed differences in PF and knowledge when compared to those with less than 10 years of experience with no statistical significance. However, personnel with more than 20 years of experience demonstrated a significant difference in both PF and knowledge compared to those with less than 10 years of experience (b=0.21, p=0.04), as shown in Table 1.

Kendall's coefficient was used to evaluate the association among work experience (PF2), monthly income (PF4), and attitudes of personnel. Work experience and monthly income showed a slightly negative and positive association with attitude (b= –0.15 and 0.17, respectively). There was no association between POS with neither knowledge nor attitude by either multiple regression analysis or Kendall's coefficient, respectively. These results are shown in Table 1 and 2.

Table 1. Demographic information and correlation of knowledge, attitude and practice with personal factors (PF) and perceived organizational support (POS) of objective and key results (OKRs) by multiple regression analysis

	n (%)	Knowledge				Practice			
		Un-Co-ef		St-Co-ef	p-value	Un-Co-ef		St-Co-ef	p-value
		B	SE	Beta		B	SE	Beta	
Constant		9.02	0.37		<0.001	3.24	0.23		<0.001
PF1									
Male	197 (89.1)	Ref.							
Female	24 (10.9)	0.13	0.15	0.06	0.36	0.06	0.09	0.04	0.53
PF2 (years)									
<10	72 (32.6)	Ref.							
11 to 20	91 (41.2)	–0.19	0.15	–0.13	0.21	–0.01	0.09	–0.01	0.91
>20	58 (26.2)	–0.28	0.14	–0.21	0.04	0.12	0.09	0.15	0.17
PF3									
<BD	29 (13.1)	Ref.							
BD	164 (74.2)	0.21	0.2	0.11	0.31	–0.02	0.13	–0.02	0.84
>BD	28 (12.7)	0.2	15	0.13	0.2	–0.04	0.1	–0.05	0.66
PF4 (USD)									
Up to 441.19	44 (19.9)	Ref.							
441.2 to 735.3	61 (27.6)	0.02	0.17	0.01	0.92	0.08	0.11	0.1	0.45
>735.32	116 (52.5)	–0.05	0.16	–0.04	0.74	0.06	0.1	0.06	0.55
PF5									
Staff	32 (14.5)	Ref.							
Sup/head	189 (85.5)	0.28	0.16	0.15	0.08	–0.08	0.1	–0.07	0.42
PF6 (years)									
1 to 2	44 (19.9)	Ref.							
3 to 4	75 (33.9)	0.23	0.16	0.18	0.17	–0.07	0.1	–0.09	0.47
>4	102 (46.2)	–0.11	0.15	–0.08	0.48	–0.12	0.09	–0.15	0.19
POS		0.05	0.08	0.04	0.54	0.14	0.05	0.2	<0.001

SE=standard errors; Un-Co-ef=unstandardized coefficient; St-Co-ef=standardized coefficient; BD=bachelor's degree

PF1=gender, PF2: work experience, PF3: last education, PF4: monthly income, PF5: job position, PF6: objectives and key results experience, * Exchange rate 1 US dollar=36.08 Thai Baht

Table 2. Correlation of knowledge, attitude and practice with personal factors (PF) and perceived organizational support (POS) of objective and key results (OKRs) by Kendall's coefficient

	Knowledge		Attitude		Practice	
	Co-ef	p-value	Co-ef	p-value	Co-ef	p-value
PF1	–0.08	0.24	0.03	0.70	–0.01	0.84
PF2 (years)	–0.04	0.47	–0.15	0.03	<0.001	0.98
PF3	0.06	0.29	–0.06	0.42	0.02	0.70
PF4 (USD)	0.00	0.93	0.17	0.01	0.03	0.63
PF5	<0.001	0.95	–0.13	0.05	–0.03	0.66
PF6 (years)	–0.01	0.84	–0.02	0.72	0.02	0.64
POS			0.17	0.69		

Co-ef=coefficient

PF1: gender, PF2: work experience, PF3: last education, PF4: monthly income, PF5: job position, PF6: objectives and key results experience, * Exchange rate 1 USD=36.08 Thai Baht

Discussion

The current study was conducted in a hospital setting. Ninety percent of the participants were female. A quarter of participants had more than 20 years' work experience. Nabovati et al.'s 2023 investigation from Iran used KPI for monitoring organization performance. The hospital management dashboard was the determining point. Nabovati et al.'s KPI comprised five domains, financial, human resource, quality, safety, and operational medical services[7]. Concerning human wellness, patient fall rate, physician wait time, patient satisfaction, hospital revenue, balance of finance, and bed occupancy were points of interest for analysis. All subjects in Nabovati et al.'s study were the key persons or unit heads. Compared to the current study, only one sixth of participants in the study were executive staff members. Concerning healthcare providers, knowledge, attitude, and practice of operational staff members were a point of interest for Nabovati. Nabovati et al.'s study and the current study were both

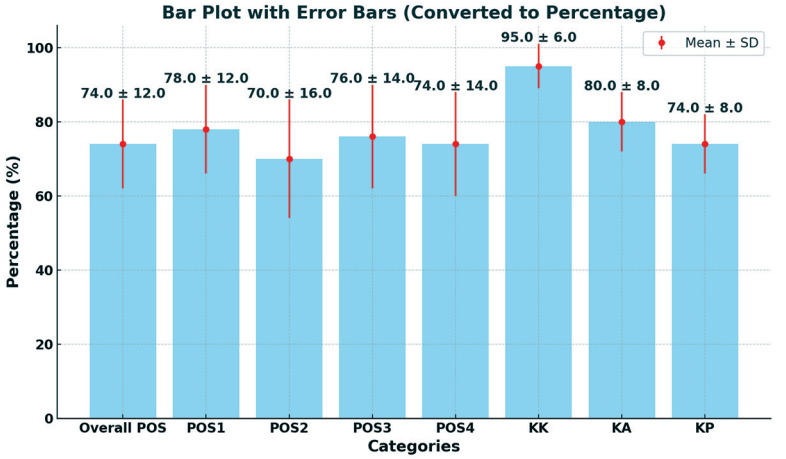

Figure 2. Demographic characteristic of perceived organization support (POS).

Overall POS: overall, POS1: performance aspect of POS, POS2: knowledge and career advancement opportunities of POS, POS3: supportive care aspect of POS, POS4: recognition of work value of POS, knowledge, attitude, and practice (KAP), KK: KAP Knowledge, KA: KAP attitude, KP: KAP practice

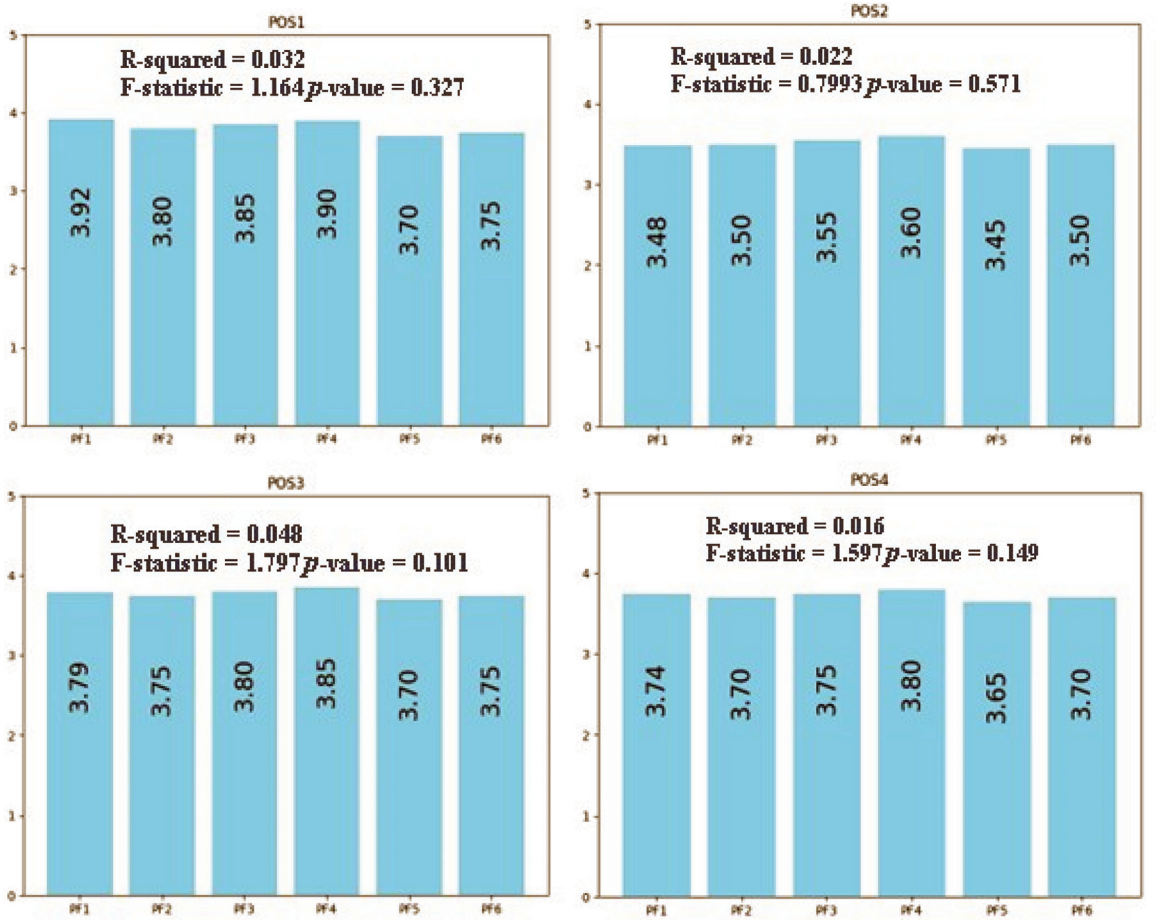

Figure 3. Comparison of personnel factor (PF) to perceived organizational support (POS) by multiple linear regression.

POS1: performance aspect of POS, POS2: knowledge and career advancement opportunities of POS, POS3: supportive care aspect of POS, POS4: recognition of work value of POS, PF1: gender, PF2: work experience, PF3: last education, PF4: monthly income, PF5: job position, PF6: objectives and key results experience, POS and PF were not statistical related.

performed in hospitals. The aim of each study was to improve performance outcomes in the field of human resources. Nabovati et al.'s work focused on patients who used healthcare services, while the current study focuses on practitioners and staff in the hospital. For future studies, the use of OKRs is recommended to improve the performance of healthcare services for patients.

The study conducted by Al-Saadi et al. used OKRs in their organizations[8]. OKRs were used to determine organizational performance, as also shown in the studies by Rompho, Al-Saadi et al., and Irikefe[1,8,9]. The current study also used OKRs to assess the knowledge associated with attitude and practice.

According to Al-Saadi et al.'s study in Oman, the research was conducted at the Ministry of Labor. The major findings showed the positive potential to motivate driven work, recognition, motivation toward competition, a technologic system, prioritizing responsibilities, and feedback integration[8]. In comparison to the current study, the KAP also showed positive outcomes after being evaluated by OKRs. Both studies focused on service providers. Healthcare providers were the focus of the current research, while Al-Saadi et al. focused on civil servants in the Ministry.

Additionally, a study conducted in Thailand by Rompho investigated 26 organizations with a variety of services that also used OKRs to evaluate organizational performance at universities[1]. The use of OKRs provided opportunities for their executives to set their own target-setting problems to benefit the organization's performance. However, some operational staff members did not notice any changes in target settings before and after implementing the OKRs[1].

In the current study, the implementation of OKRs was also used to evaluate the KAP among personnel in TUH. The outcome showed that there was a decrease in knowledge in personnel with more than 20 years of work experience. However, in the same group, the practice performance was found to increase significantly. Rompho's research focused on academic providers. They found that OKRs facilitated the adoption of performance indicators and helped to resolve issues of poor linkage between indicators and organizational strategy as well as inappropriate goal setting. The current paper focused on both academic and healthcare work. The present study findings showed similar outcomes as Rompho's finding.

The study conducted by Irikefe in Nigeria used OKRs to assess organizational performance along with KAP[9]. The current study used OKRs to evaluate personnel knowledge. Irikefe's study evaluated organizational performance in the hospitality industry using hotels in Abuja. The comparison between the hospital and hotel settings was made due to their similar features, including service care, and living arrangements. The findings showed that the hotels in Nigeria achieved their performance goals and encouraged effective communication between heads and subordinates. This practice successfully contributed to the hotel's aims of achieving customer satisfaction. In the current study, evaluating knowledge was incorporated into the OKRs to enhance organizational improvement. In comparison, the executives and staff members in the current study agreed on the effective use of OKRs.

Loçurdo Costa et al.'s paper, conducted in Brazil, was done in a restaurant setting[10]. The commonality between Loçurdo Costa et al.'s paper and the current paper was the use of OKRs for the implementation within each organization. Loçurdo Costa et al.'s paper focused on the working environment, while the current study focuses on the knowledge and attitudes associated with employee practice. The overlap between both papers was that both the restaurant and hospital settings provided food services to clients. Comparison of the present to the previous studies was summarized and presented in Table 3.

OKRs can be used to support the evaluation of KAPs among executives and operational staff. Comparison across five papers and various aspects were used for discussion[1,7-10]. The result demonstrated that the use of OKRs could effectively improve KAPs of executive and operational staff in hospital, university, and hotel organizations. Usage of OKRs for university hospital development might be the strength of the study. However, lack of OKRs usage among physicians was the limitation of the study.

Conclusion

From the current study, it was observed that the OKRs knowledge of service personnel negatively correlated with work experience exceeding 20 years. OKRs generated through a bottom-up approach might be particularly suitable for university hospitals. Attitude was found to be positively associated with higher monthly income and negatively associated with extensive work experience. This suggested that a suitable monthly income is crucial for operational medical personnel.

Excellent hospital practice requires robust

Table 3. Comparison of implementation for OKRs and KPI in organizations from previous studies

	Present	Al-Saadi	Rompho	Irikefe	Costa	Nabovati
Country	Thailand	Oman	Thailand	Nigeria	Brazil	Iran
Year	2024	2023	2022	2021	2023	2023
Subject (n)	221	11	204	207	123	234
Executive/operating*	35/186	0/11	100/104	0/201	0/123	234/0
Organization						
Hospital	Y					Y
Restaurants					Y	
Ministry of Labor		Y				
University			Y			
Hotel				Y		
Methodology						
Bibliographic survey					Y	
Semi-structured interview		Y	Y			
Questionnaire	Y			Y	Y	Y
• POS	Y					
• KAP	Y		Y	Y		
• Open questions	Y					
• Environment					Y	
• Social	Y			Y	Y	
• Economy	Y				Y	
Implementation						
OKRs	Y	Y	Y	Y	Y	
KPI						Y
Determining						
KAP	Y			Y		
Sustainability						
Organization performance		Y	Y	Y		
Hospital Mx dashboard						Y

OKRs=objective and key results; KPI=key performance indicator; KAP=knowledge, attitude, and practice; POS=perceived organizational support
* Executive: executive staff member, Operating: operating staff member

organizational support rather than reliance on individual efforts. Organizational support involves comprehensive strategies that enhance the working environment, provide continuous professional development opportunities, and foster a culture of collaboration and shared goals. Such support is crucial for maintaining a high standard of care and operational efficiency for transforming into a supra-tertiary hospital.

What is already known on this topic?

Hospital operation involves a complex network of competencies, structures, protocols, and specialties. Medical services are bound by guidelines, governing bodies, and funding from both public and private sources. Government hospitals in Thailand operate as non-profits but must balance treatment costs with revenue from self-payments or insurance. The OKRs methodology helps organizations achieve goals through clear, motivating objectives and measurable, quantitative results with regular evaluations and a bottom-up approach. Previously, hospitals used KPIs to measure performance, relying on top-down control and annual evaluations. KPIs influenced promotions and pay based on documented rules and organizational regulations. The current study compares both OKR and KPI methodologies in hospital settings. Most were commonly used to achieve organizational goals. While a previous study focused on OKR through a qualitative approach using interviews, the current study compared hospital management and KPI through quantitative methods.

What does this study add?

The OKR knowledge of service personnel was negatively correlated with work experience

exceeding 20 years. OKRs generated through a bottom-up approach might be particularly suitable for university hospitals. Attitude was found to be positively associated with higher monthly income and negatively associated with extensive work experience. This suggested that a suitable monthly income is crucial for operational medical personnel.

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Conflicts of interest

The authors declare no conflict of interest.

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