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Assessment of healthcare providers' knowledge, attitude, and practice toward medical research in southwest Saudi Arabia: a cross-sectional study

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Abstract

Background Medical research plays a crucial role in advancing the treatment and prevention of diseases, in addition to enhancing public health.

Objectives This study aims to assess knowledge, attitude, and practice (KAP) of healthcare providers (HCPs) in relation to medical research, identify motivating factors and barriers that prevent them from conducting research, and identify associated factors with good knowledge, practice and positive attitude.

Methods In this cross-sectional study, a validated questionnaire was employed to gather data of HCPs who work at healthcare institutions affiliated with MOH. The Proportionate stratified random sampling method was used to recruit HCPS. Proportion (%), and median and interquartile range (IQR) were used to represent the data. Logistic regression analysis was carried out to identify associated factors with good knowledge, positive attitude, and good practice.

Results A total of 285 HCPs were included in the analysis. The median score for knowledge was 43%, with scores ranging from 14 to 57%, for most participants showing variability in their knowledge levels. For attitude, the median score was 100%, indicating a generally positive outlook, with scores between 80% and 100% for most participants. The practice score had a median of 59%, with scores ranging from 33 to 83%, showing a wide range in research activity among the HCPS. The most reported motivators were strength of the resume (91.80%) and fulfilment of work requirements (90.80%). The most reported barriers were lack of financial support (82.3%), poor time management (78.7%), no enough research facilities (75.2%), lack of motivation (74.8%), inadequate skills and knowledge (72.3%), and lack of rewards (71.6%). Good knowledge was significantly associated with taken research methodology course (p. value = 0.001) and qualification (p. values = < 0.05). Positive attitude was significantly associated with workplace and qualification. Nationality (p. value = 0.005) and taking a research methodology course (p. value = 0.001) were significantly associated with good practice.

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Conclusion Although HCPs showed a positive attitude towards medical research, their knowledge and practice were inadequate. They are necessarily needed for amelioration. This improvement can be achieved through effective and regular research methodology courses, workshops, and enhancement of the research environment.

Keywords HCPs, Knowledge, Attitude, Practice, Motivating factors, Barriers, Saudi

Introduction

Medical research, often referred to as health research, involves scientific methods to obtain better information with respect to human diseases, suitable treatment, prevention of diseases, and health promotion [1]. It can also yield significant information with regard to trends of diseases and risk factors, effective treatments or interventions of public health, practical abilities, patterns of healthcare, uses, and costs [2].

Today's quickly advancing medical or health research requires that healthcare providers (HCPs) be up to date with the most current development. It is crucial that the research should be the goal of every HCP so as to contribute to the generation of evidence. Adequate knowledge, attitude, and practice (KAP) are essential for conducting research studies [3].

As HCPs should engage in research to improve their practice and contribute to the evidence base of medical knowledge. HCPs are supposed to understand the research rather than just read it [4–6]. Moreover, understanding of HCPs for the medical research in order to design suitable studies and interpret the findings properly help in improving healthcare and enhancing the medical outcomes. Strengthen the research skills of HCPs so they can assess evidence critically, cooperate on projects-based research, and analyze the data using advanced statistical software [7, 8].

There are some steps need to be considered when conducting research studies, including; identify the research problem, formulating a hypothesis, reviewing the relevant literature, preparing the study design, selecting a valid and appropriate tool, collecting the data and analysing them, writing the result and discussion, and providing the recommendation [9, 10].

Moreover, conducting medical research requires HCPs to possess sufficient knowledge of research methods, maintain a positive attitude, and demonstrate strong research practices. However, several barriers impeded their ability to engage in research, including improper skills in research methodology, lack of motivation, limited time, and work-related stress [11, 12].

Several studies have been conducted to evaluate the knowledge, attitudes, and practices related to research among medical students. A study conducted in India found that most medical students had knowledge with respect to research, a positive attitude, and barriers were lack of time, awareness, funds, and difficulty in monitoring patients [13]. Another study carried out in India reported that despite resident doctors showed a fair knowledge and positive attitude regarding the research, that did not reflect the practice of most of them [11].

A recent study conducted in Syria stated that the resident doctors had weak knowledge and poor practice about using evidence-based medicine [14]. In China, knowledge of HCPs about health research was fair, and the conduct of research was poor [15]. Further, a recent study in Iraq reported poor knowledge of medical students and low participation in medical research; however, their attitude was positive [16].

In the Kingdom of Saudi Arabia (KSA), a cross sectional study revealed poor knowledge, a positive attitude and fair practice of medical students [17]. In addition, another study stated that the knowledge of medical students toward research was poor, but their attitude was positive. They reported the main barriers were lack of research skills, time management, and improper feedback [18]. In Taif, KSA, knowledge of physicians toward medical research was unsatisfactory. However, their attitude was positive [19].

Although these studies highlight important insights into the research-related KAP of medical students, there is a notable scarcity of research focused on HCPs. Given that HCPs play a critical role in advancing medical research, understanding their KAP, as well as the factors that motivate or hinder their participation in research, is crucial. Therefore, the current study aims to assessthe KAP of HCPs toward medical research, identifythe motivating factors, and barriers they face, and determine the factors associated with good knowledge and practice, and positive attitude.

Materials and methods

Study design and location

A cross-sectional study was conducted to evaluate the KAP of HCPs affiliated with the Ministry of Health (MOH)'s healthcare institutions in Najran, KSA. Najran is a region located in the southwestern of KSA and has residents of roughly 435,000. The region is about 365,000 square kilometres.

Inclusion criteria

1. HCPs who work as the following categories: physicians, dentists, pharmacists, nurses, and staff in the following departments: public health, infection prevention and control, radiology, laboratory,

respiratory therapy, physiotherapy, and operation room.
2. HCPs in Najran, KSA.

Exclusion criteria

1. Administrative workers.
2. Students.

Participants were informed about the objectives and the study purpose. In addition, they were informed about their right to withdraw from the study any time. Their data was confidential.

Sampling methods and sample size

This study was followed a proportionate stratified random sampling method. In the region of Najran, KSA, there are ten governmental hospitals as demonstrated in the table below. The table shows the capacity of each hospital and the total number of HCPs according to proportionate method Table 1.

The sample size calculated using the following formula [20]:

$$n = \frac{\frac{Z^2 X\ p\ (1-p)}{e^2}}{1 + \left(\frac{Z^2\ \mathrm{X\ p\ (1-p)}}{e^2 N}\right)}$$

Where:
n: Sample size.
N: population size.
p: Sample proportion.
Z: Critical Value (95% confidence level).
e: Margin of error (degree of precision).

The number of HCPs was roughly 8892 [21]. The estimation of p was 50% [21] for knowledge, attitude, and practice; 1.96 representing 95% CI was taken for Z; margin of error (degree of precision) was 0.05.

Table 1 HCPs selected from each hospital according to proportionate sampling method

Hospital	Bed capacity	Total HCPs	Sample (*N*)
1	50	300	14
2	100	1500	70
3	70	400	19
4	50	280	13
5	50	231	11
6	50	300	14
7	100	400	19
8	200	1600	74
9	200	2000	93
10	300	2320	108
Overall			435

1: Khobash general hospital, 2: Sharorah general hospital, 3: Habona general hospital, 4: Thar general hospital, 5: Bader Alganoob general hospital, 6: Yadamah general hospital, 7: Psychiatric hospital, 8: New Najran general hospital, 9: Maternity and Children hospital, 10: King Khalid hospital

Therefore, provided that $N = 6000$, $p = 0.5$, $Z = 1.96$ for the 95% CI, and $e = 0.05$. The sample size was 362. The sample then was increased 20% for non-responsive HCPs. Therefore, the overall sample size was 435 HCPs.

The proportion of HCPs was measured using the following formula:

$$\frac{\text{Total number of HCPs in each hospital}}{\text{Overall number of HCPs in the region}} X \text{ sample size } (435)$$

Additionally, in each hospital, HCPs from each department was identified and recruited randomly.

Study instrument and data collection

A validated English questionnaire by a previous study was used to assess the KAP of HCPs towards medical research [18]. A Google Form was used to collect the data of HCPs. The questionnaire consists of six sections; the first section involves the Socio-demographic data of the HCPs, the second section involves seven items for assessment of knowledge, the third section involves five items for the attitude, the fourth section involves six items for practice, the fifth section involves eleven items for barrier preventing them from conducting research, and sixth section involves seven items for motivating factors. The data was gathered between May 1st 2024 and June 30th 2024, and the HCPs needed roughly 9–16 min to complete the questionnaire. Moreover, the aim of the study was clearly stated to the study participants, and then the informed consent to participate in this study was obtained from them before answering the questionnaire.

Knowledge score

An overall of seven questions were related to the knowledge elements. The summed up score (minimum score = 0, maximum score = 7) was classified as poor or good. A score of "0" was indicated an incorrect response and "1" was indicated a correct response, and the total score of individual was scored as demonstrated in the following formula:

$$\frac{\text{Correct responses related to the knowledge questions}}{\text{Total number of knowledge questions}} X\ 100$$

The cutoff point for poor or good knowledge was relied on 75th percentile [21]. Therefore, poor knowledge was scored < 75th percentile, and good knowledge was scored ≥ 75th percentile.

Attitude score

In terms of attitude, five questions were related to the attitude elements. The summed up score (minimum

score = 1, maximum score = 5) was classified as negative or positive. A score of "0" was indicated an incorrect response and "1" was indicated a correct response, and then the total score of individual was scored as demonstrated in the following formula:

$$\frac{\text{Correct responses related to the attitude questions}}{\text{Total number of attitude questions}} X\ 100$$

The cutoff point for negative or positive attitude was relied on 75th percentile [21]. Therefore, negative attitude was scored < 75th percentile, and positive attitude was scored ≥ 75th percentile.

Practice score

Regarding practice, six questions were related to the practice elements. The summed up score (minimum score = 1, maximum score = 6) was classified as poor or good. A score of "0" was indicated an incorrect response and "1" was indicated a correct response, and the total score of individual was scored as demonstrated in the following formula:

$$\frac{\text{Correct responses related to the practice questions}}{\text{Total number of practice questions}} X\ 100$$

The cutoff point for poor or good practice was relied on 75th percentile [21]. Therefore, poor practice was scored < 75th percentile, and good practice was scored ≥ 75th percentile.

Table 2 Socio-demographic characteristics of the study participants

Variable		*N*	%
Age, Median (IQR)		39	(35–44)
Gender	Female	27	9.6
	Male	255	90.4
Nationality	Saudi	229	81.2
	Non-Saudi	53	18.8
Working place	PHC	23	8.2
	Hospital	181	64.2
	Cluster	53	18.8
	MOH branch	25	8.9
Qualification	Diploma	70	24.8
	Bachelor	89	31.6
	Master	79	28
	Board	9	3.2
	PhD	19	6.7
	Fellowship	16	5.7
Have you taken research methodology course?	No	131	46.5
	Yes	151	53.5

IQR: Interquartile range. PHC: Primary health center. MOH: Ministry of health

Statistical analysis

Proportion (%), median and interquartile range (IQR) were used to represent the data. Logistic regression analysis was carried out to identify associated factors with good knowledge, positive attitude, and good practice. Univariate analysis was used to identify statistically significant associated demographic variables KAP and then significant factors were included in the multivariate analysis. IBM SPSS version 28 was employed for data analysis.

Ethical approval

The ethical approval was obtained from ethical committee at new Najran general hospital (IRB Log number 2024-06 E) before carrying out this study.

Results

The required sample size was 362 HCPs, and the response rate was (78.7%) 285 participants. Of the HCPs (285) who participated, three were excluded due to their more missing data. Socio-demographic characteristics of the study participants are demonstrated in Table 2. Median age was 39 years (IQR = 35–44) and majority 90.4% of the participants were male. Most of them working at hospitals while minority working at primary healthcare centers (PHCs) and branch of the MOH in the region. While 32% and 28% of the HCPs had Bachelor and Master degrees, only few of them had Board (3.2%), Fellowship (5.7%), and PhD (6.7%). In terms of research methodology course, about 53.5% of the participants have taken the course.

HCPs' median (IQR) knowledge score was 43% with scores ranging from 14 to 57% for most participants showing variability in their knowledge. Of 282 HCPs, 41.1% showed good knowledge regarding the main structure of the abstract, and only 15.6% identified the proper sampling methods. About 61% had good knowledge regarding the essential elements of informed consent. Less than 47% had good knowledge regarding reference style, and software used for statistical analysis and reference management (Table 3).

In terms of the HCPs' attitude, median (IQR) attitude score was 100%, indicating a generally positive outlook, with scores between 80% and 100% for most participants. About 76% agreed that the MOH should provide more training on the research methodologies, and HCPs should do more contributions of medical researches. Regarding the importance of medical research, 78% of the HCPs agreed that it enhances understanding of disease prevalence, while approximately 81% believed that the medical research contributes to better therapeutic outcomes. Additionally, around 78% acknowledged the significance of medical research in advancing career progression. (Table 4)

Table 3 Responses of the study participants to questions related to knowledge towards research

Question	Response	*N*	%
Which of the following is not an element of a structured abstract?	Result	40	14.2
	Method	35	12.4
	Acknowledgment [Correct]	116	41.1
	I do not know	91	32.3
Which one of the following is nonprobability sampling method?	Quota sampling [Correct]	44	15.6
	Simple random sampling	95	33.7
	Systematic sampling	84	29.8
	I do not know	59	20.9
Which of the following elements is essential in an informed consent?	Purpose of the research	30	10.6
	Confidentially of data	31	11.0
	Voluntary participation and withdrawal rights	16	5.7
	All of the above [Correct]	171	60.6
	I don't Know	34	12.1
What does the abbreviation "et al. "mean?	And other authors [Correct]	129	45.7
	All authors contributed equally	68	24.1
	I don't know	85	30.1
What does it indicate when the $P < 0.05$?	The result is statistically significant [Correct]	132	46.8
	The result is not statistically significant	56	19.9
	I don't Know	94	33.3
Which of the following software can be used for statistical analysis?	Trello	30	10.6
	SPSS [Correct]	131	46.5
	EndNote	20	7.1
	I don't Know	101	35.9
Which of the following software can be used for reference management?	Trello	47	16.7
	SPSS	44	15.6
	EndNote [Correct]	80	28.4
	I don't Know	111	39.4

Table 4 Responses of the study participants to questions related to attitude towards research

Statement	Response	*N*	%
Ministry of health should train their HCPs more about research methodologies.	Disagree	33	11.7
	Uncertain	35	12.4
	Agree	214	75.9
HCPs should participate more in medical research.	Disagree	31	11
	Uncertain	37	13.1
	Agree	214	75.9
Undertaking medical research improve HCPs' understanding of disease prevalence.	Disagree	27	9.6
	Uncertain	35	12.4
	Agree	220	78
Medical research has a positive influence on treatment outcomes.	Disagree	27	9.6
	Uncertain	28	9.9
	Agree	227	80.5
Research experience enhances carrier progression	Disagree	25	8.9
	Uncertain	38	13.5
	Agree	219	77.7

Table 5 Responses of the study participants to questions related to practice towards research

Question	Response	*N*	%
Have you participated in writing any medical research?	No	84	29.8
	Yes	198	70.2
Do you read medical journals consistently?	No	102	36.2
	Yes	180	63.8
Have you attended workshops on research methodologies?	No	134	47.5
	Yes	148	52.5
Have you presented a research poster?	No	125	44.3
	Yes	157	55.7
Have you published any research paper in a medical journal?	No	95	33.7
	Yes	187	66.3
Have you received an award for any research project?	No	173	61.3
	Yes	109	38.7

Regarding the research practices of HCPs, the median practice score was 59% with scores ranging from 33 to 83%, showing a wide range in research activity among the HCPS. Around 70% had participated in writing medical research, 66.3% had published articles in medical journals, and 64% regularly read medical journal. Additionally, 53% had attended workshops on research methodologies, and 56% had participated in research poster presentations. However, only 38.7% had received awards for their research projects. (Table 5)

HCPs indicated the most barriers that deterred them from carrying out the researches which included lack of financial support (82.3%), poor time management (78.7%), no enough research facilities (75.2%), lack of motivation (74.8%), inadequate skills and knowledge (72.3%), and lack of rewards (71.6%). However, the least barriers were inability to find a research title (51.8%) and lack of interest (57.4%). (Fig. 1)

Regarding the motivating factors that encourage HCPs to conduct researches, the most reported motivators were strength the resume (91.80%) and fulfillment of work requirements (90.80%). Other five motivating factors were reported equally ranging from 82.30 to 87.60%. (Fig. 2)

Univariate logistic analysis was conducted to identify variables associated with good knowledge, positive attitude, and good practice. The significantly associated variables with knowledge were nationality, taken a research methodology course, working place, and qualification. The significantly associated variables with attitude were age, nationality, working place and qualification. Age, nationality, taken a research methodology course, working place, and qualification were significantly associated variables with good practice.

Multivariate logistic regression analysis for variables associated with good knowledge, positive attitude and good practice is presented in Table 6. The significantly

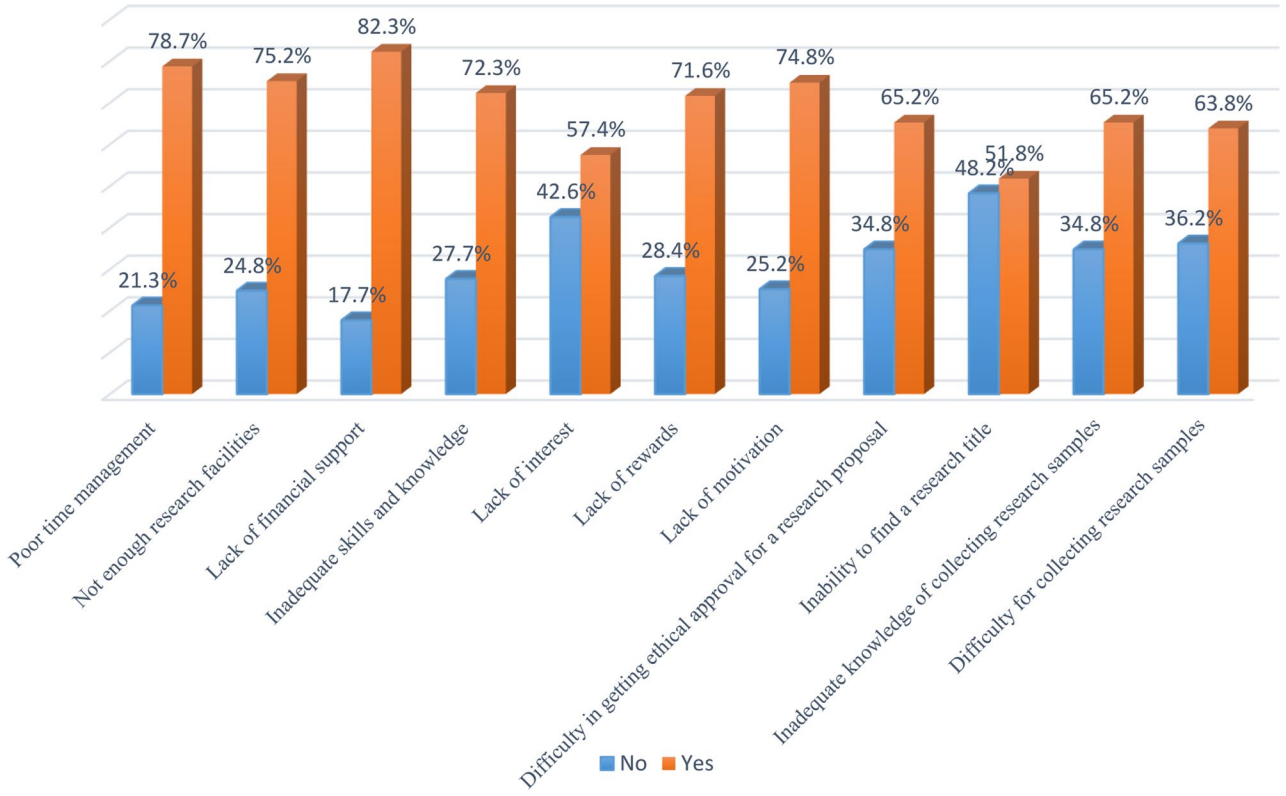


Fig. 1 Barriers preventing HCPs from carrying out research

associated variables with good knowledge were taken research methodology course and qualification. The significantly associated variables with positive attitude were working place and qualification. Nationality and taken research methodology course were significantly associated variables with good practice.

HCPs who have taken research methodology course were 3.4 times more likely to have good knowledge compared to those who have not taken the course (AOR=3.434, CI=1.885–6.253, *P*=0.001). Compared with HCPs who had diploma degree, HCPs who had PhD and Fellowship were nine (AOR=9.098, CI=2.357–35.126, *P*=0.001) and eight (AOR=9.543, CI=1.933–29.491, *P*=0.004) times, respectively, more likely to have good knowledge.

Compared with HCPs who worked at PHCs, HCPs who worked at cluster were three times more likely to have positive attitude (AOR=3.085, CI=1.078–8.826, *P*=0.036). HCPs who hold master degree were two times more likely to have positive attitude than those who hold diploma degree (AOR=2.198, CI=1.071–4.511, *P*=0.032).

Compared with Saudi HCPs, the practice's score of non-Saudi decrease by about 20% (AOR=0.196, CI=0.062–0.618, *P*=0.005). HCPs who have taken research methodology course were about 12 times more likely to have good practice compared to those who have not taken the course (AOR=11.927, CI=6.084–23.382, *P*=0.001).

Discussion

To the best of our knowledge, this cross-sectional study is the first to evaluate the KAP of HCPs towards medical research, revealed motivating factors and barriers, and identified associated variables with good knowledge, positive attitude, and good practice. The findings revealed that while HCPs demonstrated positive attitudes, their knowledge, and practice were poor, reflecting a lack of research activities and educational programs. This study also identified the key barriers to conducting research, as well as the primary motivating factors. Moreover, this study highlighted specific groups of HCPs those with diploma, bachelor, and board degrees, as well as those working in PHCs and hospitals who showed poor knowledge and practice, indicating areas in need of improvement.

HCPs' median (IQR) knowledge score in the current study was 43% (14–57%) indicated a poor knowledge, which was similar to a study conducted in the KSA [2]. In contrast, a study carried out in India reported that the average knowledge score of medical students towards research was 70% [13]. Another study conducted in the KSA reported the average knowledge score of healthcare practitioners was 57% [18].

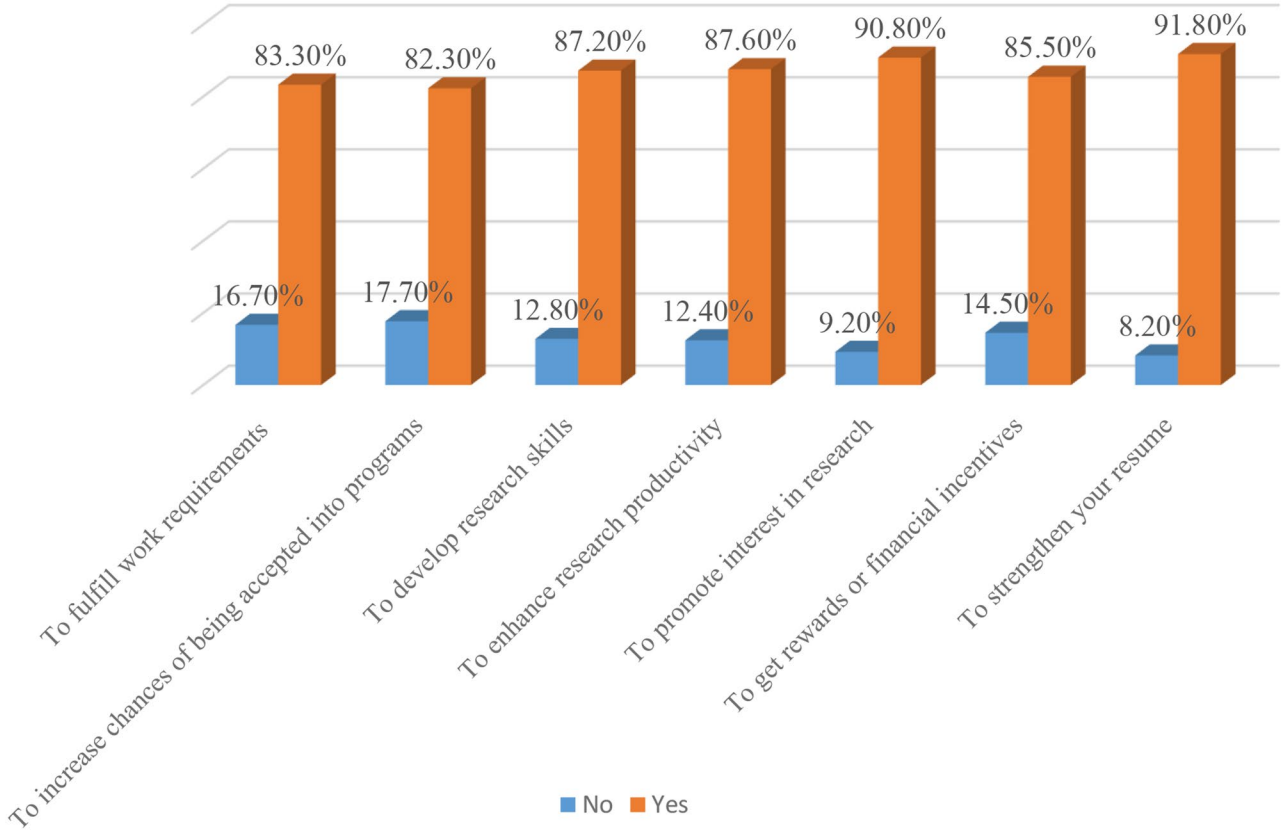


Fig. 2 Motivating factors encouraging HCPs to carry out research

Although 60% of study participants were able to identify essential elements of informed consent, unfortunately, their knowledge to the main structure of the abstract, and software used for statistical analysis and were ranged from 45 to 47%. A study carried out in the KSA [18], was similar to the finding of the current study except for proper sampling methods and reference management where the knowledge of the HCPs in the current was 16% and 28%, respectively.

Interestingly, the HCPs in the current study showed a positive attitude, which was coincided with three previous studies [11, 18, 21]. Vast majority of HCPs in the current study wished to get more training on the research methodologies, contributed to medical researches. Finding a study conducted by Al Sayegh et al. [18] and Pallamparthy et al. [13] were congruent with our findings. Health researchers are very important in creating new diagnostic tools which help in early detection of diseases, earlier therapy, and consequence of better outcomes [2, 22]. Similarly, most of HCPs in the current study agreed that the medical researches improve the understanding of disease prevalence and provide good therapeutic outcomes. In terms of medical researches regarding the improvement of carrier progression, majority of HCPs in the current study stressed on this merit as reported by previous study [17].

HCPs in our study indicated poor research practices as shown by other studies [11, 17, 18]. About 70% of the study participants in the current study participated in writing medical research and 66.3% published manuscripts. This could be explained that they might rely on researcher advice agencies in doing researches. In contrast, the participation in writing health researches was ranged between 38 and 53% in previously published studies [17, 18, 23]. Study participants in the current study stated that they attended workshops related to research methodologies and participated in research posters at 53% and 56%, respectively. This finding were in line with a study carried out in by Al Sayegh in the KSA [18]. Comparably, 91% of healthcare givers in a study carried out in the KSA attended workshops related to research methodologies and 44% of them presented research posters [23]. Roughly 38% of the HCPs in the current study received awards. Healthcare providers in a study conducted in the KSA showed dissimilar percentage which was about 22% [18].

Training and courses regarding medical research are often a lack in curriculum of HCPs especially non-medical workers. Therefore, this study highly underscores the

Table 6 Multivariate logistic regression analysis for variables associated with good knowledge, positive attitude and good practice

Variable		Knowledge			Attitude			Practice		
		AOR	(95% CI)	*P*. value	AOR	(95% CI)	*P*. value	AOR	(95% CI)	*P*. value
Age					1.018	(0.977–1.060)	0.399	0.976	(0.935–1.018)	0.256
Nationality	Non-Saudi	1.074	(0.474–2.430)	0.864	1.762	(0.747–4.156)	0.196	0.196	(0.062–0.618)	0.005*
	Saudi	Ref.	Ref.		Ref.	Ref.		Ref.	Ref.	
Taken a course	Yes	3.434	(1.885–6.253)	0.001*				11.927	(6.084–23.382)	0.001*
	No	Ref.	1					Ref.	Ref.	
Working place	Hospital	0.504	(0.124–2.047)	0.338	1.409	(0.565–3.511)	0.462	0.500	(0.195–1.279)	0.148
	Cluster	0.539	(0.201–1.443)	0.219	3.085	(1.078–8.826)	0.036*	0.517	(0.180–1.485)	0.221
	MOH branch	0.458	(0.145–1.439)	0.181	3.084	(0.854–11.136)	0.086	0.777	(0.226–2.667)	0.689
	PCH	Ref.	Ref.		Ref.	Ref.		Ref.	Ref.	
Qualification	Bachelor	0.130	(0.701–3.491)	0.249	1.011	(0.521–1.962)	0.973	0.534	(0.261–1.091)	0.085
	Master	4.639	(2.013–10.691)	0.001*	2.198	(1.071–4.511)	0.032*	1.281	(0.563–2.915)	0.556
	Board	2.659	(0.530–13.338)	0.234	2.523	(0.471–13.488)	0.279	0.848	(0.146–4.865)	0.843
	PhD	9.098	(2.357–35.126)	0.001*	1.346	(0.380–4.761)	0.645	3.752	(0.869–16.208)	0.077
	Fellowship	7.55	(1.933–29.491)	0.004*	2.768	(0.657–11.652)	0.165	1.687	(0.371–7.678)	0.499
	Diploma	Ref.	Ref.		Ref.	Ref.		Ref.	Ref.	

AOR: Adjusted odds ratio. CI: Confidence interval. Ref: Reference. * Significant at $P=0.05$

need for involving research methodology course in the curriculum of both medical and non-medical students in order to equipped them properly during conducting researches either before or after joining the work as HCPs. Moreover, interventional training programs and continues workshops could be used to better inform such courses.

The current study identified the most barriers that deterred HCPs from carrying out the researches, which included lack of financial support, poor time management, no enough research facilities, lack of motivation, inadequate skills and knowledge, and lack of rewards. Similarly, a study conducted by Ibrahih et al. [17] reported the most barriers against research were lack of research training, time for research education, time for conducting research, and statistical support. Other studies highlighted obstacles preventing resident and medical doctors from conducting researches such as lack of time, inadequate skills and knowledge, and some personal reasons, particularly learning of general practitioners taking up a lot of time [11, 18]. The mentioned barriers could be resolved throughout enhancement the research environment, periodic research activities and education programs, support researchers through finance, time, and awards.

In terms of the motivating factors, in the present study, the top factors were strength the resume and fulfillment of work requirements. In line with our findings, a study reported the most motivating factors that encourage the participants to carry out research were to increase opportunities of being accepted into programs and to develop research skills [18].

While the significantly associated variables with good knowledge towards medical research in the present study were taken research methodology course and qualification, age, gender, and place of work were not significant associated with good knowledge. These variables were congruent with a previous study [17]. However, another study revealed a significant association between gender and knowledge [13]. Moreover, a study conducted in the same region to assess the KAP of HCPs towards antibiotic resistance during pandemic found association between good knowledge and nationality, cadre, qualification and working place [21].

The significantly associated variables with positive attitude towards medical research in the present study were working place and qualification. Comparably, in the KSA, age, nationality, and qualification were associated with positive attitude of HCPs towards antibiotic resistance during pandemic [21].

In this study, nationality and completion of research methodology course were significantly associated with good practice among the HCPs. Non-Saudi HCPs had practice scores that were approximately 20% lower than

their Saudi counterparts. This difference may be attributed to the fact that non-Saudi HCPs tend to have professional-based education, while Saudi HCPs typically have academic or mixed-mode educational backgrounds. In contrast, previous study conducted in the same region found that age, cadre, qualifications and workplace were the most significantly associated with good research practice [21].

The current study presents several strengths that contribute to its significance in the field. First, it is the first study to assess the KAP of HCPs toward medical research, while also identifying motivating factors, barriers, and associated variables to KAP. Second, this study provides a representative overview of HCPs' KAP regarding medical research across the entire region. Third, the use of a proportionate sampling method effectively controlled for selection bias, enhancing the reliability of the findings. Additionally, the study identified associated factors influencing the KAP of HCPs through both univariate and multivariate analyses.

However, there was a few limitations to consider. First, the response rate was approximately 65% which might lead to selection bias, and those who declined to participate may have had different perspectives. Nonetheless, it is unlikely that nonresponding HCPs have a different point of views. Second, the finding of this study may not be generalizable to all Saudi HCPs, as the research was conducted specifically in the Najran region of KSA. Third, as a cross-sectional study it cannot establish causal relationships or assess long-term trends in healthcare providers' knowledge, attitudes, and practices. Fourth, the study relied on subjective assessments of HCPs and did not consider other outcome factors. Lastly, the study faced challenges in controlling confounding variables, such as years of experience. While years of experience in medical practice were considered, they may not be relevant to medical research unless the HCPs are specifically interested or their roles require it.

According to the findings of the current study, we highlight some critical practical recommendations such as implementing periodic research methodology training programs, creating mentorship programs, establish research units at healthcare institutions, encouraging collaboration with academic institutions, providing incentives for research participation, talking the issue of time constraints, and supporting researchers through access to research resources. By considering the importance of these recommendations, healthcare organizations can foster a more supportive and conducive research environment, leading to improve the quality of research and outcomes.

Conclusion

This study demonstrated that HCPs possess poor knowledge and practices related to medical research, however, their attitude was positive.

Research plays a crucial role in advancements and solutions, particularly within the medical field. Thus, it is essential for HCPs to improve their knowledge and practices to achieve the success in this field. This improvement can be achieved through effective and regular research methodology courses, workshops, and the development of a supportive research environment. To better inform such strategies, interventional and prospective studies can be leveraged.

Abbreviations

KAP	Knowledge attitude and practice
HCP	Healthcare providers
KSA	Kingdom of Saudi Arabia
MOH	Ministry of Health
IQR	Interquartile range

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Author contributions

HAS: Conceptualization, methodology, data analysis, writing - original draft, supervision, revision of final manuscript and approved submission; AAR: Conceptualization, methodology, data analysis, revision of final manuscript and approved submission; AAM: Conceptualization, study design, review & editing, revision of final manuscript and approved submission; FAS: Conceptualization, data collection, writing, review & editing, revision of final manuscript and approved submission; YA: Data collection, writing, revision of final manuscript and approved submission; MA: Conceptualization, data collection, revision of final manuscript and approved submission; AA: Data collection, writing, revision of final manuscript and approved submission; HAH: Data collection, data analysis, revision of final manuscript and approved submission; YA: Data collection, study design, revision of final manuscript and approved submission; AAK: Study design, data collection, data analysis, revision of final manuscript and approved submission; NA: Conceptualization, Data collection, methodology, revision of final manuscript and approved submission; MM: Conceptualization, methodology, review & editing, revision of final manuscript and approved submission; AAS: Conceptualization, methodology, review & editing, revision of final manuscript and approved submission, supervision.

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Data availability

The dataset generated and analyzed during the current study are available upon request to primary investigator.

Declarations

Ethical approval

The ethical approval was obtained from ethical committee at new Najran general hospital (IRB Log number 2024-06 E) before carrying out this study.

Consent for publication

Not applicable.

Clinical trial number

Not applicable.

Competing interests

The authors declare no competing interests.

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