



Evidence-based practice with knowledge, attitude and practice of ophthalmic nursing staffs: a cross-sectional study in south China

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Background: This study aims to investigate the current status and influencing factors of evidence-based practice (EBP) with knowledge, attitude and practice (KAP) of ophthalmic nursing staffs in south China.

Methods: Using a convenient sampling method, we selected 429 ophthalmic nursing staffs from 28 ophthalmology specialist hospitals or general hospitals in south China, and investigated their general information and implemented the evidence-based practice questionnaire (EBPQ).

Results: The scores of EBP and KAP of ophthalmic nursing staffs in south China from high to low were as follows: practical attitude (4.85±1.07 points), practical behavior (4.42±1.14 points), practical knowledge and skills (4.30±0.65 points). The single factor analysis results showed that the first graduation degree, technical title, scientific research achievements, whether or not participate in EBP training, the frequency of reading literature at ordinary time, and whether or not participate in EBP project were the influencing factors of EBP level; the multi-factor analysis results showed that EBP attitude, EBP knowledge and skills, whether or not participate in EBP training were independent influencing factors of EBP.

Conclusions: The ophthalmic nursing staffs in south China have a positive attitude towards EBP, however, their EBP knowledge, skills and behavioral capabilities need to be focused and improved. The ophthalmic nursing administrators should fully master the factors affecting the implementation of EBP, and take effective intervention measurement to improve the EBP abilities of ophthalmic nursing staffs, and promote the development of EBP in ophthalmology specialty.

Keywords: Ophthalmic nursing; evidence-based practice (EBP); knowledge and skill; influencing factor

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Introduction

Evidence-based practice (EBP), as a new concept, practice method and decision-making mode, has become a recognized and important research hotspot in the field of health care domestic and overseas. It has great significance for the development of medical and health care systems and the promotion of various disciplines development. In the development of nursing disciplines, integrating EBP

into the daily decision-making of nursing staffs, providing patients with better treatment outcomes, and improving the quality and standardization of nursing care are the working key points of global health and medical institutions (1). However, studies have shown that in clinical nursing practice and decision-making, a large part of nursing work is still dominated by traditional nursing models, not based on the best evidences (2,3). As well, most of the ophthalmic nursing care work is based on traditional nursing models

or experience guidance. With the rapid development of the medical level of various specialties, it is becoming more and more important to guide ophthalmic nursing work based on EBP. Studies have shown that evidence-based application not only improves perioperative management behavior of ophthalmic daytime surgery and provides guidance for postoperative ophthalmic management, but also improves discharge readiness of patients with daytime surgery and promotes the improvement of the quality of eye care services (4,5). But the full EBP application in ophthalmic nursing is still a challenge. The aim of this study is to study the EBP levels of ophthalmic nursing staffs in south China, consider the factors that affect the development of EBP, and provide references for cultivating scientific research talents in ophthalmic nursing and promoting the development of EBP.

We present the following article in accordance with the MDAR reporting checklist (available at <https://aes.amegroups.com/article/view/10.21037/aes-21-23/rc>).

Methods

Participants

In March–April 2020, we used a convenient sampling method to select ophthalmic nursing staffs in south China as investigation objects. The inclusion criteria were as follows: length of service ≥ 1.0 year, formal authorized or contracted registered nurses, informed consent and voluntary participation in this study. Totally 429 ophthalmology nurses from 28 ophthalmology specialist hospitals or ophthalmology centers in general hospitals participated in the investigation, including 6 directors of the nursing department and 39 head nurses. Among them, 317 nurses (73.9%) came from ophthalmology specialist hospitals. The average age of the study objects was 32.77 ± 7.81 years, and the average length of service was 11.13 ± 8.56 years. More than half of them had participated in EBP nursing training (57.8%). Regarding the implementing of EBP project, 311 (72.5%) staffs had ideas but no practice; 80 (18.7%) staffs had practised, but only 27 (6.3%) had practical results. As the instructions of the relevant departments of our hospital, this study is no ethics involved, therefore, the ethical approval process is not needed. Informed consent was taken from all participants. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

Survey tools

General information questionnaire

It was designed by researchers through literature reading and summary, and finally determined after discussion by experts. The contents included: demographic characteristics, length of service, job title, post, first graduation degree, whether or not participated EBP training, etc.

The EBPQ

The scale was complied by Upton *et al.* (6) in 2006 to evaluate the EBP knowledge, skills, attitudes and behaviors of clinical nursing staffs. It has 3 dimensions with 24 items. The total scale and Cronbach's α coefficient was 0.79–0.91. The higher the score of each dimension and the total score, the higher the level of EBP and knowledge, attitude and practice (KAP) of the study subjects. Yang *et al.* (7) translated and revised the Chinese version of this scale in 2010, with specific item dimensions as follow: practical behavior (6 items), practical attitude (5 items), knowledge and skills (13 items). Each item was scored on a 7-point system. The higher the score of each dimension and the total score of the scale, the higher the frequency of implementing evidence-based behavior, the more active the practical attitude, the stronger the evidence-based skills and the higher the overall EBP level. The Cronbach's α coefficient of each dimension of the scale was 0.789–0.935, which can be used to evaluate the cognitive level of EBP of domestic nursing staffs.

Study methods

The questionnaire was sent through the questionnaire star platform, and the specific process was as follows: (I) develop questionnaires: edit the survey tools and convert them into electronic questionnaires through the questionnaire star platform; (II) create filling rules: set each question of the questionnaire as a required option; (III) generate the two-dimensional code of the questionnaire: combine the questionnaire and filling rules into a survey plan, and set the survey time limit (From March 1st to April 30th, 2020), and generate the two-dimensional code of the survey with one click. Finally, the person in charge from the target hospital was responsible for sending the QR code of the questionnaire to the research subjects to complete the electronic questionnaire. We calculated the sample content based on 5–20 times the number of items in the scale. There were 20 items in this study, and the required sample volume

Table 1 The 4 items with the lowest scores on the evidence-based knowledge and skills dimension (point, $\bar{x}\pm s$)

Items	Points
No. 1, capacity of scientific research	3.72±0.88
No. 8, ability to analyze and evaluate the quality of evidence (documents) based on existing literature evaluation standards	4.09±0.76
No. 4, ability to transform problems found in practice into research problems	4.16±0.83
No. 7, ability to retrieve information and evidence	4.21±0.81

was at least 100. In the end, totally 435 questionnaires were issued and a total of 429 valid questionnaires were returned. The effective recovery rate was 98.6%.

Statistical analysis

We used SPSS 22.0 for statistical analysis and data processing. The counting data were described by No. of patients (%); Measurement data were described by ($\bar{x}\pm s$); *t*-test, single factor analysis of variance and chi-square test were used for univariate analysis, and multiple linear regression analysis was used for multivariate analysis. $P<0.05$ indicates that the difference is statistically significant.

Results

The level of EBP of ophthalmic nurses in south China

The results showed that the total EBPQ score of the 429 subjects was 4.44 ± 0.71 points, among which the average scores of practical behavior, attitude, knowledge and skills were 4.42 ± 1.14 , 4.85 ± 1.07 , and 4.30 ± 0.65 points, respectively. The dimension with lowest EBPQ score was the evidence-based knowledge skill, and the 4 items with the lowest scores are shown in *Table 1*.

Single factor analysis of EBP level of ophthalmic nursing staffs with different characteristics

Through *Table 2*, we can see that the average scores of different technical titles ($F=4.348$, $P=0.016$), the publication contributions in recent years ($F=5.401$, $P=0.001$), whether or not participated EBP training ($t=-3.805$, $P=0.000$), the frequency of reading literature ($F=8.745$, $P=0.000$), and whether or not participated EBP project ($F=17.401$, $P=0.000$) showed statistical significance. The items of the frequency of reading literature at ordinary time ($F=3.886$, $P=0.009$) and whether or not participated EBP project ($F=11.342$, $P=0.000$) showed significant differences in

their average scores of EBP attitude dimension. Different first graduation degrees ($F=3.812$, $P=0.010$), whether or not participated EBP training ($t=-2.565$, $P=0.014$), the frequency of reading literature at ordinary time ($F=17.892$, $P=0.000$) and whether or not participated EBP project ($F=19.885$, $P=0.000$) were statistically different in EBP knowledge and skill dimension.

Multivariate analysis on influencing factors affecting EBP implementation in ophthalmic nursing staffs

Taking the practical behavior dimension of the KAP questionnaire of EBP as a dependent variable, we used the indicators that had an impact on EBPQ questionnaire score in the single-factor analysis (see *Table 3* for values) as independent variables for multiple linear regression analysis. The results showed that there were 4 factors that finally entered the regression equation. According to the degree of influence from large to small, they were evidence-based attitude, evidence-based knowledge and skills, contribution status and whether or not participated EBP training. See *Table 4* for details.

Discussion

The EBP levels in ophthalmic nursing staffs were at an intermediate level, but there was still room for improvement

The overall EBP level of ophthalmic nursing staffs in south China was at a medium level, which was higher than the EBP levels reported in some previous studies (8,9). In addition, ophthalmic nursing staffs had a positive attitude towards EBP, but were relatively poor in the implementation of EBP knowledge, skills and behaviors. This finding agrees with the study conducted in China and Amhara Region (10-12). It suggested that the primary task to promote the development of EBP in ophthalmology is to improve the knowledge and skills of EBP in ophthalmic nursing staffs.

Table 2 Comparison on average score differences among the EB PQ dimensions and questionnaire (point, $\bar{x}\pm s$)

Items	n	Practical behavior		Practical attitude		Knowledge and skill	
		Score	t/F (P)	Score	t/F (P)	Score	t/F (P)
Age (year) ^a			F=1.346 (P=0.259)		F=0.588 (P=0.623)		F=0.984 (P=0.400)
20–30	195	4.43±1.11		4.85±1.06		4.30±0.62	
31–40	172	4.37±1.16		4.88±1.09		4.30±0.67	
41–50	51	4.43±1.23		4.73±1.09		4.24±0.66	
≥51	11	5.08±1.03		5.16±0.93		4.61±0.54	
Length of service ^b (year)			t=-0.954 (P=0.234)		t=-0.069 (P=0.126)		t=-0.230 (P=0.076)
<10	223	4.37±1.17		4.85±1.08		4.30±0.65	
≥10	206	4.47±1.10		4.85±1.06		4.29±0.65	
The first graduation degree ^a			F=1.675 (P=0.172)		F=0.179 (P=0.911)		F=3.812* (P=0.010)
Technical secondary school	167	4.49±1.11		4.84±1.12		4.32±0.59	
Junior college	130	4.38±1.20		4.82±1.08		4.23±0.70	
Undergraduate	127	4.34±1.11		4.91±1.02		4.31±0.65	
Postgraduate and above	5	5.40±1.07		4.80±0.28		5.12±0.55	
Final degree (school students included) ^a			F=1.596 (P=0.190)		F=1.107 (P=0.346)		F=1.740 (P=0.158)
Technical secondary school	9	4.30±0.97		5.02±1.05		4.50±0.71	
Junior college	82	4.23±1.04		4.67±1.14		4.22±0.61	
Undergraduate	328	4.46±1.17		4.90±1.06		4.30±0.63	
Postgraduate and above	10	4.95±1.22		4.72±0.88		4.66±1.17	
Technical titles ^a			F=4.348* (P=0.016)		F=0.513 (P=0.736)		F=2.600 (P=0.157)
Primary	283	4.37±1.10		4.85±1.03		4.28±0.62	
Middle	121	4.41±1.21		4.82±1.13		4.28±0.70	
Vice-senior and above	25	5.07±1.11		5.06±1.18		4.58±0.68	
Hospital class ^b			t=2.336 (P=0.215)		t=0.526 (P=0.178)		t=1.899 (P=0.095)
Class 3	353	4.45±1.18		4.86±1.06		4.29±0.66	
Class 2	76	4.25±0.96		4.82±1.10		4.30±0.57	
Hospital type ^b			t=0.085 (P=0.425)		t=0.009 (P=0.076)		t=2.486 (P=0.136)
General	112	4.57±1.09		4.91±1.07		4.32±0.69	
Specialized	317	4.37±1.16		4.83±1.07		4.29±0.63	
Contribution ^a			F=5.401** (P=0.001)		F=0.916 (P=0.433)		F=2.402 (P=0.067)
None	282	4.27±1.14		4.80±1.04		4.27±0.63	
1–5	113	4.64±1.09		4.95±1.11		4.28±0.64	
6–10	29	4.91±1.08		5.04±1.16		4.60±0.79	
≥11	5	5.03±1.07		4.56±1.18		4.46±0.42	

Table 2 (continued)

Table 2 (continued)

Items	n	Practical behavior		Practical attitude		Knowledge and skill	
		Score	t/F (P)	Score	t/F (P)	Score	t/F (P)
EBP training ^b			t=-3.805** (P=0.000)		t=-1.505 (P=0.082)		t=-2.565* (P=0.014)
No	181	4.18±1.08		4.76±1.08		4.21±0.62	
Yes	248	4.60±1.15		4.92±1.06		4.36±0.66	
Literature reading frequency ^a			F=8.745** (P=0.000)		F=3.886** (P=0.009)		F=17.892** (P=0.000)
Occasionally	221	4.20±1.13		4.71±1.06		4.14±0.57	
Sometimes	176	4.57±1.08		4.96±1.07		4.37±0.63	
Often	28	5.10±1.13		5.31±0.97		4.90±0.78	
Always	4	5.50±1.22		5.15±0.66		5.27±0.89	
EBP project ^a			F=17.401** (P=0.000)		F=11.342** (P=0.000)		F=19.885** (P=0.000)
Never thought	38	3.58±0.92		4.07±0.77		4.00±0.55	
Have thoughts but no practice	311	4.36±1.07		4.85±1.02		4.23±0.59	
Practised and stopped encountering difficulties	53	4.95±1.04		5.18±1.06		4.59±0.68	
Practised and achieved results	27	5.24±1.40		5.36±1.34		4.98±0.75	

^a, one-way analysis of variance; ^b, t-test; *, P<0.05; **, P<0.01. EBP, evidence-based practice; EBPQ, evidence-based practice questionnaire.

Table 3 Possible influencing factors and values of the implementation of evidence-based nursing practice behavior

Indicators	Variable	Values
The first graduation degree	X1	Technical secondary school =1, Junior college =2, undergraduate =3, postgraduate and above =4
Technical titles	X2	Primary =1, middle =2, vice-senior and above =3
Contribution	X3	None =1, 1-5=2, 6-10=3, ≥11=4
EBP training	X4	No =0, yes =1
Literature reading frequency	X5	Occasionally =1, sometimes =2, often =3, always =4
EBP project	X6	Never thought =1, have thoughts but no practice =2, practised and stopped encountering difficulties =3, practised and achieved results =4
Attitude	X7	Actual score
Knowledge and skill	X8	Actual score

EBP, evidence-based practice.

In our study, the low level of EBP knowledge and skills of ophthalmic nursing staffs was mainly reflected in aspects such as the scientific research ability, the ability to analyze and evaluate the quality of evidence (documents) based on existing literature evaluation standards, and the ability

to transform problems found in practice into research problems. Moreover, the ophthalmic nursing staffs who participated in EBP training and EBP project, with more scientific research achievements, and with higher frequency of reading literature at ordinary time had stronger ability

Table 4 Multiple regression analysis results after implementation of EBP nursing (n=429)

Independent variables	b	SE	β	t	P
Constant	-0.902	0.302	-	-2.988	0.003
Attitude	0.561	0.040	0.525	14.144	0.000
Knowledge and skill	0.430	0.070	0.243	6.165	0.000
Contribution	0.218	0.072	0.128	3.011	0.003
EBP training	0.231	0.080	0.100	2.902	0.004

EBP, evidence-based practice.

to implement EBP practice behaviors ($P < 0.05$). This was similar to the results of Hu *et al.* (13) showing that EBP skills, EBP training experience, and contribution experience were the main factors affecting the EBP behavior of nursing clinical teachers. The training of evidence-based skills is an effective way to improve the knowledge and skills of EBP and the implementation of behaviors among nurses, which can furthermore promote the development of clinical EBP (9,14). In summary, the ophthalmic nursing staffs should focus on and strictly demand themselves, take the initiative to learn, improve literature retrieval ability, form the habit of reading literature at ordinary time, actively participate in evidence-based scientific research training or research project items, and increase their knowledge and skills in EBP.

Nursing departmental managers should take the lead and provide supportive leadership

This study showed that the higher the technical title, the stronger the ability to implement EBP ($P < 0.05$). This finding is supported by the studies conducted in the mid-Atlantic region and Spanish (15,16). Generally, as leaders and managers in nursing departments, most of them have higher technical titles and educational qualifications, and have more opportunities to participate in academic conferences and training courses. In addition, they have rich clinical and scientific research experience and have a better keen insight into clinical problems, discover the importance of EBP in clinical nursing work, and thus have more responsibility to promote the development of EBP in the nursing department. In the sorting items of our research: *Please select the three most influential factors that you believe to develop evidence-based nursing practice, and sort them from high to low.* The top three answers were *Leadership Support* (140/429), *Scientific Research Ability* (95/429) and *Time and Energy* (62/429). Studies have shown that the leadership

of the head nurses in the transformation of evidence was positively correlated with the EBP ability of nurses (17). Therefore, as managers and leaders in department, they not only need to have good evidence-based nursing quality, but also should encourage, support and authorize nurses the EBP, and provide supportive leadership for them to carry out EBP, including the provision of learning resources and appropriate time giving. For instance, the department can build a scientific research team, regularly organize document retrieval, reading, evaluation, and other sharing reports, integrate the scientific research thoughts into nursing ward rounds and case discussions, exercise nurses' abilities to find problems, to verify, transform and apply the evidence, so as to build a good atmosphere of scientific nursing research and EBP as well as to help nurses improve their scientific research thoughts and EBP levels.

Hospitals should attach importance to ophthalmic nursing talents cultivation and create more opportunities for learning and development

With the development and promotion of EBP, nursing research led by clinical nurses is developing rapidly. Correctly examine the obstacles in clinical nurses' scientific research development has great importance in taking targeted measures to improve the overall scientific research level of the nursing team and even improving the quality of hospital nursing services. The study results showed that no contribution and not participating EBP training and EBP project were the main obstructive factors for ophthalmic nursing staffs to implement EBP behavior ($P < 0.05$). This finding agrees with the results Galiano showed (18). The reason was that, on the one hand, the highest educational level of the study subjects was mainly junior college or undergraduate (95.6%, 410/429), and they had not received systematic and in-depth evidence-based nursing education

and scientific research writing training; on the other hand, they were too busy in clinical nursing work to allocate time and energy or even mobilize their enthusiasms in scientific research. Studies have shown that developing evidence-based nursing practice training and setting up targeted and individualized nursing research project items play an important role in improving nurses' scientific research capabilities (18,19). Therefore, it is recommended to encourage ophthalmic nursing staffs to participate in academic education, let them fully play their subjective initiative, improve their educational levels, and their EBP levels. Hospitals should regularly organize nursing research related lectures, EBP knowledge and skills training, provide libraries and document retrieval resources, etc., and provide hardware facilities for improving their scientific research abilities. Through the formulation of incentive policies for scientific research achievements, ophthalmic nursing staffs are encouraged to actively carry out scientific research projects and perform scientific research achievements contributions, and ultimately push forward the clinical practice of ophthalmic nursing and promote the development of ophthalmic nursing disciplines.

Conclusions

With the development and promotion of the EBP concept, the EBP has been gradually applied in various nursing fields, but the application of ophthalmic care is still in its infancy. This study is the first domestic investigation of the EBP level of ophthalmic nursing staffs from many medical centers, and it explores the influencing factors affecting the behavior implementation of EBP. The study results showed that ophthalmic nursing staffs in south China had a better attitude towards EBP but their own capabilities of scientific research and implementation of EBP behaviors needed to be furthermore improved. Therefore, based on the EBP level and influencing factors of ophthalmic nursing staffs, the targeted scientific research training, encouragement of continuing education, leadership support and formulation of incentive policies play a key role in improving the scientific research level of ophthalmic nursing staffs and promote clinical practice of ophthalmic nursing and the development of ophthalmic nursing specialty, and it also provides references for the construction of EBP in other nursing specialty fields. However, this study also has certain limitations. The samples were selected mainly by convenient sampling method, and primarily from the ophthalmology hospitals which cooperated with the researchers' unit,

showing regional clustering limitation. The design of our research is a cross-sectional survey study, and there is a lack of comprehensive and in-depth understanding and listening. It is recommended that such surveys can be conducted in combination with qualitative interviews in the future.

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Footnote

Reporting Checklist: The authors have completed the MDAR reporting checklist. Available at <https://aes.amegroups.com/article/view/10.21037/aes-21-23/rc>

Data Sharing Statement: Available at <https://aes.amegroups.com/article/view/10.21037/aes-21-23/dss>

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <https://aes.amegroups.com/article/view/10.21037/aes-21-23/coif>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). As the instructions of the relevant departments of our hospital, this study is no ethics involved, therefore, the ethical approval process is not needed. Informed consent was taken from all participants.

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