

HOSTED BY



Contents lists available at ScienceDirect

## International Journal of Nursing Sciences

journal homepage: <http://www.elsevier.com/journals/international-journal-of-nursing-sciences/2352-0132>

## Research Paper

## Needs assessment and expectations regarding evidence-based practice knowledge acquisition and training activities: A cross-sectional study of healthcare personnel in China

Janita Pak Chun Chau <sup>a</sup>, Wai Tong Chien <sup>a</sup>, Xu Liu <sup>a,\*</sup>, Yan Hu <sup>b</sup>, Yinghui Jin <sup>c</sup><sup>a</sup> The Nethersole School of Nursing, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong, China<sup>b</sup> School of Nursing, Fudan University, Shanghai, China<sup>c</sup> Centre for Evidence-Based and Translational Medicine, Zhongnan Hospital of Wuhan University, Wuhan, China

## ARTICLE INFO

## Article history:

Received 6 June 2021

Received in revised form

1 November 2021

Accepted 16 November 2021

Available online 26 November 2021

## Keywords:

Administrative personnel

Evidence-based practice

Health personnel

Surveys and questionnaires

## ABSTRACT

**Objectives:** Evidence-based healthcare contributes to the improvement of healthcare quality and informs healthcare decision-making. The provision of timely high-quality evidence is always required to fulfil the ever-changing needs and expectations of healthcare personnel. This study aimed to assess the needs and expectations of healthcare personnel regarding evidence-based healthcare in China.

**Methods:** We conducted a cross-sectional online survey from December 8, 2020 to January 15, 2021 involving 901 participants across China. Healthcare providers, policy makers, researchers and educators, and full-time postgraduate medical and nursing students working/living in China were eligible to participate. A self-developed questionnaire was used.

**Results:** Participants generally agreed that health-related research evidence was beneficial. Evidence-based resources, such as Cochrane resources, were only known or used by about half of the respondents due to difficulties related to availability and accessibility. Various types of resources, topics of evidence, and themes of workshops were of particular interest to most of the participants.

**Conclusions:** The dissemination and translation of evidence, provision of more support in evidence availability, offering evidence-based training, and determining the most in-demand research areas have been identified as priority areas of work which could fulfil the needs and expectations of healthcare personnel in China.

© 2022 The authors. Published by Elsevier B.V. on behalf of the Chinese Nursing Association. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## What is known?

- Evidence-based healthcare in China has developed rapidly over the past two decades and its importance to healthcare has been well-recognised.
- Frontline clinicians in China possess a low to moderate level of evidence-based practice competency and limited experience in knowledge translation.

## What is new?

- Difficulties related to the availability and accessibility of the latest and sufficient evidence resources, especially Cochrane resources, were identified by one-third to half of the respondents.
- Practical evidence related to public health and implementation science, and workshops related to evidence quality appraisal, interpreting systematic reviews, and knowledge translation are highly needed.
- Advocates for evidence-informed health care are highly expected to provide reliable synthesised evidence, support Chinese healthcare research, and promote regional, international, and interdisciplinary collaboration.

\* Corresponding author.

E-mail addresses: [janitachau@cuhk.edu.hk](mailto:janitachau@cuhk.edu.hk) (J.P.C. Chau), [wchien@cuhk.edu.hk](mailto:wchien@cuhk.edu.hk) (W.T. Chien), [monicaxuliu@163.com](mailto:monicaxuliu@163.com) (X. Liu), [huyan@fudan.edu.cn](mailto:huyan@fudan.edu.cn) (Y. Hu), [jinyinghui0301@163.com](mailto:jinyinghui0301@163.com) (Y. Jin).

Peer review under responsibility of Chinese Nursing Association.

<https://doi.org/10.1016/j.ijnss.2021.11.001>2352-0132/© 2022 The authors. Published by Elsevier B.V. on behalf of the Chinese Nursing Association. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## 1. Introduction

Evidence-based practice contributes to improving healthcare quality and equity, and informs healthcare decision-making, particularly with regard to recommending appropriate evidence-based interventions [1,2]. With support from governments, professional associations and international organisations, evidence-based healthcare in China has developed rapidly over the past two decades, as highlighted by the development of medical and nursing curriculums, and sharp increases in the number of empirical studies and publications of well-conducted systematic reviews in the country [2–6]. Moreover, many frontline clinicians have exhibited a positive attitude towards evidence-based healthcare and agree that its implementation is necessary in clinical environments [7–9]. However, previous studies have also suggested that clinicians in China possess a low to moderate level of evidence-based practice competency [7,10–12], as well as limited experience in applying new knowledge and practicing knowledge translation [8,13,14].

The extent of knowledge translation depends on whether the chosen topic is a priority area to be addressed, the availability of the evidence, how clinicians adapt new knowledge to local contexts, the practice environment, and the implementation strategies adopted. Other determinants include the knowledge and attitudes related to evidence-based practice, whether clinicians possess the skill sets needed for applying evidence-based principles to knowledge translation, and their educational background [7,8,11,12]. In addition, an imbalance in the support for the development and organisation of evidence-based healthcare among different disciplines, healthcare and academic institutions, and regions has led to great diversity in demand for learning resources and knowledge translation strategies [3,5,8]. Thus, to promote evidence-informed healthcare and knowledge translation, it is imperative to provide the most-needed evidence and training based on a comprehensive understanding of the needs and expectations of healthcare personnel, especially for advocates for evidence-informed health care, which are often well-equipped with evidence resources [15,16].

Cochrane, a global independent network of researchers, professionals, patients, carers and people interested in health, has taken the lead in advocating for evidence-informed healthcare decision-making by producing high-quality systematic reviews and other synthesised research evidence. The Cochrane China Network has recently been launched to represent Cochrane and support evidence-based practice and policy decision-making in China [17]. It consists of the Cochrane China Centre and eight affiliates from eight cities/regions in China, including Chengdu, Beijing, Chongqing, Lanzhou, Ningbo, Shanghai, Wuhan, and Hong Kong. The centre and affiliates are leading institutions in the region with expertise in research and practice in the areas of traditional Chinese medicine, nursing, public health, implementation science, knowledge translation, evidence-based methodology, clinical epidemiology, and health technology assessment. The Cochrane China Network serves as a collaborative platform where leading institutions on evidence-based healthcare work together to disseminate trusted evidence and to improve the use and rigor of evidence in enhancing citizens' health and wellbeing. It also serves as a bridge linking China and other countries/regions in which the Cochrane centre/affiliates are located and facilitates communication and evidence translation on regional/global health promotion.

As a country-based collaborative network and an advocate for evidence-informed health care, the Cochrane China Network has the potential to provide the most needed and tailored resources to healthcare personnel and to fulfil their expectations on evidence-informed healthcare in China. However, previous relevant studies

were mostly conducted at a single institution, focused on specific groups of healthcare providers, such as doctors or nurses, or most importantly, were out-of-date [7,8,18]. No up-to-date nationwide data on the most needed resources and expectations of healthcare personnel were available. This study therefore aimed to identify the needs of healthcare personnel within the region with respect to the evidence on healthcare when making decisions, and to understand their expectations of the roles and duties of advocates for evidence-informed healthcare, such as the Cochrane China Network.

## 2. Methods

### 2.1. Aims

The aims of this study were to assess: (i) experiences of healthcare personnel regarding identifying and utilising research evidence; (ii) their knowledge and use of Cochrane resources; (iii) priority topics for which they need trustworthy information and evidence-based resources, types of evidence needed, training workshops required, and preferred evidence presentation formats; and (iv) their expectations of the roles and duties of advocates for evidence-informed healthcare.

### 2.2. Study design, setting, and participants

A multicentre, cross-sectional online survey was conducted from December 8, 2020 to January 15, 2021. Frontline healthcare providers (e.g., physicians, nurses, pharmacists, physiotherapists, and dietitians), managers of acute and rehabilitation institutions, nursing homes, health policy makers, researchers, educators, and postgraduate medical and nursing students who were working or living in China during the survey period were eligible to participate.

Since the online survey was conducted through the Cochrane China network, we anticipated that at least 800 respondents would complete the survey. Such a sample size ( $n = 800$ ) would be adequate to estimate the prevalence rates of various needs and expectations related to evidence-based health care with a margin of error of at most  $\pm 3.5\%$  at a level of significance of 0.05. The sample size calculation was performed using PASS 16 (NCSS, Kaysville, USA).

### 2.3. Measures

A survey questionnaire was developed based on a review of existing literature and adapted from previous surveys [9,19–22]. The questionnaire consisted of four sections. The first section collected respondents' socio-demographic information, including their positions, education levels, the regions where they resided, and their associated evidence-based affiliates (if appropriate). The second section examined respondents' experiences and perceptions of finding and using research evidence using a 4-point Likert scale (from 1 = strongly disagree to 4 = strongly agree). The third section assessed respondents' awareness and experience of using Cochrane resources through Yes/No questions. It also included three questions asking respondents to state their reasons for not using Cochrane resources before, their frequency of using Cochrane resources, and challenges they encountered when using Cochrane resources.

The fourth section aimed to identify respondents' needs and expectations of advocates for evidence-informed healthcare. It consisted of five questions related to needs assessment, covering (i) priority topics; (ii) evidence resource types, (iii) practical evidence areas, (iv) themes of evidence-based practice workshops, and (v) preferred formats for presenting synthesised research evidence. There were also 11 items regarding expectations of aspects such as

increasing collaboration with partners from other countries and improving international visibility, which were measured using a 4-point Likert scale (1 = not at all, 2 = to some extent, 3 = to a large extent, 4 = fully, 9 = do not know). The last question in this section inquired about respondents' willingness to get involved with the Cochrane China Network. The questionnaire was reviewed and finalised by the centres and affiliates located in eight cities/regions in China.

#### 2.4. Data collection

A survey webpage including an informed consent page and the survey questionnaire using MyCuForm (<https://www.itsc.cuhk.edu.hk/tc/all-it/business-applications/mycuform/>), a secure survey platform, was created. The online survey was disseminated to universities and healthcare institutions including hospitals, clinics and community centres via mass emails and social media including Facebook, Twitter, and WeChat.

Respondents who accessed the survey link were informed of the aims, investigators, risks, and benefits of the study. They were then requested to sign an informed consent form prior to the study by clicking the "I consent" button on the homepage. Respondents answered the survey anonymously via the link, and no identifiable information was collected. Respondents were allowed to leave any inapplicable questions blank and quit the survey at any time. The online survey was open from December 8, 2020 to January 15, 2021. Subsequently, the principal investigator exported the data from the password-protected internet survey platform and stored the data securely. The eligibility of the respondents was assessed again via the respondents' socio-demographic information provided (i.e., the first section of the questionnaire). Ineligible respondents, such as non-healthcare personnel, undergraduate students, healthcare workers living in countries other than China, were removed from the database. In addition, questionnaires with missing data amounting to 50% or more were regarded as invalid responses.

#### 2.5. Data analysis

Descriptive analyses were conducted using IBM SPSS version 25.0 (IBM Corp, Armonk, NY). Results were presented in frequencies and percentages for categorical variables, such as respondents' characteristics, knowledge and use of evidence-based healthcare resources, priority topics needed, and evidence presentation formats preferred. Means with standard deviations were used to describe continuous variables, such as respondents' experiences and perceptions of locating and using research evidence, the perceived necessity of different evidence resources, practical evidence types needed, workshops required, and the extent of expectations of various aspects of the Cochrane China Network.

#### 2.6. Ethical approval

The protocol for this research project has been approved by the Survey and Behavioural Research Ethics Faculty Sub-committee, The Chinese University of Hong Kong, Hong Kong (reference number: SBRE-20-229). All respondents gave informed consent before taking part.

### 3. Results

A total of 901 responses were received, of which 886 responses were valid (98.3%). The respondents were from 30 provincial-level administrative regions across China. Regarding respondents' characteristics, a majority were frontline healthcare providers such as nurses and doctors, comprising nearly half (48.1%) of all

respondents. The next largest group was full-time postgraduate medical and nursing students, making up 29.0% of all respondents. Other respondents included academics and researchers (18.1%); pharmacists, laboratory physicians, physical therapists (2.8%); and healthcare managers and government policy makers (2.0%). Nearly all (98.4%) had a baccalaureate or higher degree, and over half (55.5%) held a master's degree. Only about one-tenth (13.2%) of the respondents were doctoral degree holders. A total of 29.7% of respondents were from evidence-based affiliates.

#### 3.1. Experience regarding identifying and utilising research evidence

As shown in [Table 1](#), respondents generally agreed that research evidence was crucial, had influenced their decision-making, and that they had access to reliable evidence. However, despite these positive views, half of the respondents suggested that they found it difficult to stay updated on the latest research evidence. When asked about their beliefs regarding evidence-based practice, most respondents were generally positive regarding its implementation. Yet, nearly half indicated that they were not particularly familiar with evidence-based practice, and about a third of respondents found it difficult to find sufficient evidence-based resources.

#### 3.2. Awareness and use of Cochrane resources

Over half (54.5%) of the respondents indicated that they were aware of Cochrane resources. Cochrane Library was the most well-known and commonly used Cochrane resource, followed by Cochrane Reviews. The Cochrane Central Register of Controlled Trials (CENTRAL) was also known to about one-fourth of the respondents, but its usage was significantly lower than that of the Library and Reviews. Furthermore, the remaining Cochrane resources, namely Clinical Answers, Journal Club, and others, were relatively unknown and had rather low usage rates ([Table 2](#)).

As for respondents who indicated that they had never used Cochrane resources in the past, the main reason was simply that they did not know of Cochrane and were unfamiliar with it (65.5%). Others conveyed that they seldom used evidence in clinical practice or were unable to access the Cochrane Library from their institutions. A few looked to other sources for evidence, and some were hindered by language.

Regarding the frequency of usage, half of the respondents who had used Cochrane resources indicated that they used them a few times per year, while around a third used them a few times per month. Only about 15.0% of respondents used the resources more frequently, such as a few times per week or even daily.

Respondents described some challenges they encountered while using Cochrane resources. The most common difficulties were the availability and accessibility of the resources. Respondents found it hard to search for appropriate or relevant evidence as they were unfamiliar with advanced search functions, and they commented that the portal was not sufficiently user-friendly. Besides issues with locating evidence-based resources, respondents noted other major obstacles including inaccessibility of resources due to paywalls, or technical difficulties such as not being able to download Google documents including the Risk of Bias 2 tool and guideline. Other frequently cited challenges were language difficulties and a lack of Cochrane training which led to difficulty in navigating various resources or in interpreting findings, and issues with the scope and quality of evidence, which meant that they were either unable to assess the quality of evidence, or were unable to find evidence relevant to their needs or the Chinese context.

**Table 1**  
Respondents' experience regarding identifying and utilising research evidence (N = 886).

Items	Number of responses <sup>a</sup>	Strongly disagree	Disagree	Agree	Strongly agree
It is important for me to obtain reliable health-related research evidence	880	15 (1.7)	4 (0.5)	270 (30.7)	591 (67.1)
I have access to reliable sources of health-related research evidence	875	19 (2.2)	147 (16.8)	524 (59.9)	185 (21.1)
It is easy to keep up to date with the latest research evidence	877	57 (6.5)	385 (43.9)	324 (36.9)	111 (12.7)
Research evidence has influenced my health-related decision-making	879	18 (2.0)	80 (9.1)	515 (58.6)	266 (30.3)
Research evidence is available in my preferred language	872	28 (3.2)	188 (21.6)	460 (52.7)	196 (22.5)
Evidence-based practice improves clinical care	883	7 (0.8)	17 (1.9)	463 (52.4)	396 (44.9)
Evidence-based practice improves patient outcomes	876	5 (0.6)	29 (3.3)	499 (57.0)	343 (39.1)
Research evidence improves patient outcomes	874	5 (0.6)	43 (4.9)	513 (58.7)	313 (35.8)
Research evidence significantly guides clinical practice	872	6 (0.7)	12 (1.4)	403 (46.2)	451 (51.7)
I use evidence-based practice a lot in my work	878	19 (2.2)	202 (23.0)	476 (54.2)	181 (20.6)
I am very familiar with evidence-based practice	880	35 (4.0)	365 (41.5)	374 (42.5)	106 (12.0)
I have difficulty finding sufficient evidence-based resources	875	36 (4.1)	276 (31.6)	471 (53.8)	92 (10.5)

Note: Data are n (%). <sup>a</sup> Sample size for different items varied due to missing data.

**Table 2**  
The awareness and use of various types of Cochrane resources (N = 886).

Type of Cochrane resource	Awareness	Usage
Cochrane Library	398 (44.9)	384 (43.3)
Cochrane Reviews	306 (34.5)	260 (29.3)
Cochrane Central Register of Controlled Trials (CENTRAL)	210 (23.7)	144 (16.3)
Cochrane Clinical Answers	106 (12.0)	68 (7.7)
Cochrane Journal Club	46 (5.2)	17 (1.9)
Cochrane Podcast	26 (2.9)	19 (2.1)
Cochrane Special Collections	26 (2.9)	15 (1.7)
Cochrane Blogshots	23 (2.6)	11 (1.2)

Note: Data are n (%).

### 3.3. Priorities of the evidence-based resources

A notable majority indicated that they desired practical evidence and evidence-based practice workshops. A significant demand was also noted for news on Cochrane and the Cochrane China Network. Regarding the areas in which practical evidence was preferred, the most popular choices included the prevention of diseases and conditions, promotion of well-being, and the development and evaluation of treatments and therapeutic interventions. On the topics for which respondents sought more trustworthy information, respondents were most interested in public health and implementation strategies.

Respondents were also asked about desired workshop themes. Almost all the listed topics, including evidence quality appraisal, interpreting systematic reviews or meta-analysis, and knowledge translation, were in equal demand. As for the most preferred formats for presenting synthesised research evidence, a majority of respondents desired to see short journal articles and systematic reviews. Just as popular were visual and short translated summaries while less preferred formats included podcasts, blogs, and monthly newsletters (Table 3).

### 3.4. Expectations of the roles and duties of advocates for evidence-informed healthcare

Respondents were asked about the contributions they hoped a network of Cochrane centre and affiliates in China could make. Expectations expressed were related to providing accurate and reliable evidence, supporting the development of Chinese healthcare research, increasing regional, international, and interdisciplinary collaboration, achieving excellence in research and innovation, identifying priority research areas, and strengthening the capacity to address current health challenges. Some further expectations were also emphasised. Generally, respondents hoped that resources could be more financially accessible and that more

support could be provided to primary hospitals. They also hoped that there could be more international collaborations to facilitate the dissemination of updated evidence and that more evidence relevant to the Chinese context could be made available (Table 4).

When asked about how they wished to get involved with Cochrane, about half were interested in authoring Cochrane Reviews (44.7%) or being Cochrane citizen scientists (43.5%). About a third were interested in joining knowledge translation projects (29.7%), and one-fourth were interested in being peer reviewers (21.6%) or joining the translation team (20.7%). Only a minority (14.8%) did not wish to get involved with Cochrane.

## 4. Discussion

This nationwide, multi-centre, cross-sectional study assessed healthcare personnel's experience regarding identifying and utilising research evidence and Cochrane resources, the demand for evidence-based resources, and expectations of the roles and duties of advocates for evidence-informed healthcare like the Cochrane China Network. The results suggest that healthcare personnel consider research evidence and evidence-based practice to be significantly beneficial to both their decision-making and patient outcomes, and are largely interested in getting involved in evidence-based healthcare organisations like Cochrane (Table 1 and Section 3.4). However, they did not appear to be confident in their abilities to implement them in practice (Table 1). This may be linked to their perceived difficulty in locating appropriate resources, including Cochrane resources (Table 2) and a lack of experience, which aligns with previous studies [7,8,10,12–14]. The findings suggest that healthcare providers and scholars require more support regarding the availability of evidence resources, including Cochrane resources, and in improving the competency of finding and using evidence resources.

Improving availability of evidence resources is possible through strengthening the dissemination and translation of evidence. Given the low awareness and evidence usage rates uncovered through the survey, this is an area that needs to be addressed and remedied, for example by disseminating and translating evidence through participants' preferred methods, namely short journal articles, systematic reviews, and visual and translated evidence summaries (Table 3). A knowledge translation framework developed by Cochrane can help achieve more robust implementation of appropriate dissemination practices and ensure that knowledge translation products reach the most desired audience [23]. As for Cochrane resources which are presented in various formats (Table 2) on the Cochrane platform, it would be helpful to develop easy-to-understand guidelines or organise interactive learning or webinars in Chinese for potential clients. These should be aimed at helping users not only navigate the platform but also to find the

**Table 3**  
 Priorities regarding types of resources, areas of practical evidence, topics of evidence, themes of workshops, and formats for presenting evidence (N = 886).

Items	Number of responses <sup>a</sup>	n (%)
Types of resources <sup>b</sup>		
Practical evidence	877	774 (88.3)
Evidence-based practice workshops	874	659 (75.4)
News on the Cochrane China Network	867	560 (64.6)
News on Cochrane	865	514 (59.4)
Areas of practical evidence <sup>b</sup>		
Prevention of diseases and conditions, and promotion of well-being	874	769 (88.0)
Evaluation of treatments and therapeutic interventions	870	765 (88.0)
Development of treatments and therapeutic interventions	871	762 (87.5)
Management of diseases and conditions	866	743 (85.8)
Health and social care services	869	725 (83.5)
Detection, screening, and diagnosis	870	716 (82.3)
Topics of evidence needing more trustworthy information <sup>c</sup>	886	
Public health	–	525 (59.3)
Implementation strategies	–	485 (54.7)
Cerebro–cardiovascular health	–	436 (49.2)
Cancer and palliative care	–	427 (48.2)
Mental health	–	387 (43.7)
Infectious diseases	–	379 (42.8)
Obesity	–	322 (36.3)
Themes of workshops <sup>b</sup>		
Evidence quality appraisal	863	718 (83.2)
Interpreting systematic reviews or meta-analysis	863	711 (82.4)
Knowledge translation	862	711 (82.4)
Grading of evidence	861	706 (82.0)
Development of clinical guideline	861	698 (81.0)
Use of Cochrane evidence	862	676 (78.5)
Conducting Cochrane reviews	858	642 (74.8)
Formats for presenting synthesised research evidence <sup>c</sup>	886	
Short journal articles	–	537 (60.6)
Systematic reviews	–	534 (60.3)
Visual summaries (e.g., diagrams and infographics)	–	480 (54.2)
Short summaries translated into your preferred language	–	466 (52.6)
1–2-page plain language summaries	–	402 (45.4)
Videos	–	302 (34.1)
Tables	–	298 (33.6)
Social media posts (e.g., WeChat, WhatsApp, Facebook, Twitter)	–	261 (29.5)
Monthly newsletters	–	190 (21.4)
Blogs or Blogshots	–	125 (14.1)
Podcasts	–	81 (9.1)

Note: <sup>a</sup> Sample size for different items varied due to missing data. <sup>b</sup> Numbers and percentages of participants who rated 4–5 (score range 1–5, 1 = least needed and 5 = most needed). <sup>c</sup> Item with multiple choices.

**Table 4**  
 Expectations of the roles and duties of the Cochrane China Network (N = 886).

Items	Number of responses <sup>a</sup>	Not at all	To some extent	To a large extent	Fully	Do not know
Provide accurate and reliable information	853	14 (1.6)	15 (1.7)	173 (20.3)	589 (69.1)	62 (7.3)
Support the development of Chinese healthcare research	861	12 (1.4)	25 (2.9)	197 (22.9)	571 (66.3)	56 (6.5)
Strengthen interdisciplinary collaboration	859	11 (1.3)	27 (3.1)	203 (23.6)	560 (65.2)	58 (6.8)
Provide evidence retrieval and evaluation services for clinicians	856	13 (1.5)	29 (3.4)	193 (22.5)	557 (65.1)	64 (7.5)
Achieve excellence in research and innovation (e.g., more high impact publications and patents)	860	13 (1.5)	29 (3.4)	206 (24.0)	556 (64.6)	56 (6.5)
Organise collaborative evidence-based practice training	856	15 (1.8)	33 (3.8)	204 (23.8)	546 (63.8)	58 (6.8)
Increase collaborations with partners within the same region	864	10 (1.2)	38 (4.4)	210 (24.3)	549 (63.5)	57 (6.6)
Identify and address priorities for research and interventions in China	857	11 (1.3)	28 (3.3)	216 (25.2)	542 (63.2)	60 (7.0)
Strengthen the capacity to address current health challenges facing China	865	12 (1.4)	37 (4.3)	221 (25.5)	534 (61.7)	61 (7.1)
Provide timely and appropriate support to Cochrane volunteers	850	13 (1.5)	46 (5.4)	229 (26.9)	502 (59.1)	60 (7.1)
Improve international visibility	856	10 (1.2)	49 (5.7)	224 (26.1)	498 (58.2)	75 (8.8)
Increase collaborations with partners from other countries	858	10 (1.2)	46 (5.4)	231 (26.9)	492 (57.3)	79 (9.2)

Note: <sup>a</sup> Data are n (%). Sample size for different items varied due to missing data.

specific evidence that they need.

Providing evidence-based training is another focus area identified through respondents' experiences and answers regarding the difficulties and challenges of using evidence. Respondents noted that they found it challenging to interpret findings or assess evidence quality and that they were highly interested in various workshops themes such as evidence quality appraisal, results interpretation, and knowledge translation (Table 3). Thus, to allow participants to take full advantage of the resources on offer, training workshops aimed at equipping users with the skills needed to appraise, understand, and use research evidence are still required and should be identified as a priority work area for evidence-based healthcare organisations like the Cochrane China Network. In addition, topics such as public health and implementation science were among the most in-demand topics among respondents (Table 3). It is thus vital for evidence-based healthcare organisations to address their needs in these areas.

This study has several limitations. Although we have received 901 responses across 30 provincial-level regions in China, random sampling was not used. The sample size was also small because only 30 respondents on average were approached in each region. In addition, respondents were largely doctors, nurses, and full-time postgraduate students in medical and nursing fields so a limited number of responses from other disciplines or professions, such as educators, researchers, pharmacists, healthcare managers, and policy makers, were obtained. This may limit the generalisability of our findings. Moreover, about 30% of the respondents were from centres or affiliates of the Cochrane China network, which may cause an overestimation on the knowledge of evidence-based healthcare in China. Further surveys are expected to approach participants from a wider variety of institutions, disciplines and professions in healthcare.

## 5. Implications for evidence-based nursing practice

As the largest workforce in healthcare systems and primary formal caregivers, nurses play an important role in improving healthcare quality. In this study, nurses and postgraduate nursing students constituted around 40% of the respondents, indicating that they still found it challenging to engage in evidence-informed practice due to their lack of competency in locating evidence and translating it into practice. Our findings also suggest that it is crucial to identify and prioritize topics relevant to nursing for systematic reviews, and to develop the expertise of both existing and new generation nurses in critically evaluating and using evidence. Additionally, participants in this study highly valued the opportunities for international and transdisciplinary collaborations on nursing, medicine, public health, implementation science, and information science, thus highlighting the importance of mobilizing all healthcare personnel for better care.

## 6. Conclusion

Research evidence and evidence-based practice have been well-recognised by healthcare personnel as having significant benefits for clinical practice and decision-making. Strengthening the dissemination and translation of evidence, improving the availability of evidence resources, determining priority areas of research work, and providing evidence-based training workshops should be prioritised to improve and exert a positive impact on healthcare in China.

## Funding

Nothing to declare.

## Data availability statement

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

## CRediT authorship contribution statement

**Janita Pak Chun Chau:** Conceptualisation, Methodology, Investigation, Writing - original draft, Writing - review & editing, Supervision, Project administration. **Wai Tong Chien:** Conceptualisation, Methodology, Writing - review & editing, Supervision. **Xu Liu:** Methodology, Investigation, Formal analysis, Data curation, Writing - original draft. **Yan Hu:** Investigation, Resources, Writing - review & editing. **Yinghui Jin:** Investigation, Resources, Writing - review & editing.

## Declaration of competing interest

The authors declare no conflict of interest.

## Acknowledgments

We would like to extend our sincere appreciation to the centre/affiliates of the Cochrane China Network for their support in promoting and disseminating the survey. Our sincere appreciation is also extended to all participants.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijnss.2021.11.001>.

## References

- [1] Li Y, Sun X, Wang L. Evidence-based medicine in China. *Value Health* 2008;11(Suppl 1):S156–8. <https://doi.org/10.1111/j.1524-4733.2008.00379.x>.
- [2] Wang JY, Jin XJ. Evidence-based medicine in China. *Chronic Dis Transl Med* 2019;5(1):1–5. <https://doi.org/10.1016/j.cdtm.2019.02.001>.
- [3] Liu Y, Song X, Peng L, Wang Z, Gao C, Tian J, et al. Development of evidence-based medicine: focus on the abstracts of the Cochrane Colloquium. *Chin J Evidence-Based Med* 2016;16(7):842–6. <https://doi.org/10.7507/1672-2531.20160128> [in Chinese].
- [4] Li Y, Li J, Sun X, Liu M, Zhang M, Du L, et al. The origin and development of evidence-based medicine in China: the 20th anniversary of the introduction of evidence-based medicine to China. *Chin J Evidence-Based Med* 2016;16(1):2–6. <https://doi.org/10.7507/1672-2531.20160002>.
- [5] Shen J, Yao L, Li Y, Clarke M, Li Y, Fan Y, et al. Visualization studies on evidence-based medicine domain knowledge (Series 3): visualization for dissemination of evidence-based medicine information. *Chin J Evidence-Based Med* 2011;11(8):858–67 [in Chinese].
- [6] Chau JPC, Liu X, Lo SHS, Chien WT, Wan X. Effects of environmental cleaning bundles on reducing healthcare-associated *Clostridioides difficile* infection: a systematic review and meta-analysis. *J Hosp Infect* 2020;106(4):734–44. <https://doi.org/10.1016/j.jhin.2020.08.019>.
- [7] Hong J, Chen J. Clinical physicians' attitudes towards evidence-based medicine (EBM) and their evidence-based practice (EBP) in Wuhan, China. *Int J Environ Res Publ Health* 2019;16(19):3758. <https://doi.org/10.3390/ijerph16193758>.
- [8] Ji C, Sun X, Zhang M, Zheng L, Xu X, Gao M, et al. The cognition and practice of EBM in clinical staff from hospital at or above the county level in Liaoning province: a questionnaire survey. *Shanxi Med J* 2015;44(10):1107–10 [in Chinese]. [http://d.g.wanfangdata.com.cn/Periodical\\_sxyzyzz201510007.aspx](http://d.g.wanfangdata.com.cn/Periodical_sxyzyzz201510007.aspx).
- [9] Liu Y, Xu Z, Qin T, Jia R, Zhang Y, Liu G. Cognition and service demands of clinicians for evidence-based medicine in first-class hospitals in Henan: a cross-sectional study. *Chin Prevent Med* 2019;20(7):631–5. <https://doi.org/10.16506/j.1009-6639.2019.07.016> [in Chinese].
- [10] Fan F, Wang Z, Yu D, Chen C, Shen D, Yu Z, et al. General practitioners' perceptions of their practice of evidence-based chronic disease prevention interventions: a quantitative study in Shanghai, China. *BMC Fam Pract* 2020;21(1):147. <https://doi.org/10.1186/s12875-020-01212-y>.
- [11] Wang Y, Hu Y. Status and influencing factors of evidence-based nursing competences among nurses in tertiary hospitals in Shanghai. *Chin J Pract Nurs* 2017;33(11):5. <https://doi.org/10.3760/cma.j.issn.1672-7088.2017.11.017> [in Chinese].

- [12] Li J, Li G, Deng J, Ding Y. Investigation on evidence-based nursing ability of nurses and influencing factors analysis in a tertiary general hospital in Beijing. *Chin J Modern Nurs* 2019;25(35):6. <https://doi.org/10.3760/cma.j.issn.1674-2907.2019.35.003> [in Chinese].
- [13] Liu F, Zheng X, Shen Q, Leng H. Cross-sectional study on pediatric nurses' evidence-based pain management practice in class-III A hospitals of China. *Chin J Evid Based Pediatr*. 2016;11(5):6. <https://doi.org/10.3969/j.issn.1673-5501.2016.05.006> [in Chinese].
- [14] Shi J, Xiao Y, Liu R, Zhuang S, Dong Z, Liu N, et al. Cognition and practice of evidence-based medicine among practitioners engaged in chronic disease prevention and control in Shanghai municipality. *Chin J Public Health* 2017;33(11):3. <https://doi.org/10.11847/zgggws2017-33-11-09> [in Chinese].
- [15] Cullen L, Hanrahan K, Farrington M, DeBerg J, Tucker S, Kleiber C. Evidence-based practice in action: comprehensive strategies, tools, and tips from the University of Iowa hospitals and clinics. Indianapolis. In: *Sigma Theta Tau international*; 2018.
- [16] Sarkies MN, Bowles K-A, Skinner EH, Haas R, Lane H, Haines TP. The effectiveness of research implementation strategies for promoting evidence-informed policy and management decisions in healthcare: a systematic review. *Implement Sci* 2017;12(1):132. <https://doi.org/10.1186/s13012-017-0662-0>.
- [17] Cochrane. Cochrane expands its reach with the launch of a new Network across China 2021. <https://www.cochrane.org/news/cochrane-expands-its-reach-launch-new-network-across-china>. [Accessed 26 May 2021].
- [18] Pan A, Chen X, Hai Y. Investigation and analysis of the cognition and practice of evidence-based medicine among orthopedists in Beijing. *Chin Med Record* 2014;15(8):5. <https://doi.org/10.3969/j.issn.1672-2566.2014.08.034> [in Chinese].
- [19] European Commission. Public stakeholder consultation—Interim evaluation of Horizon 2020. <https://ec.europa.eu/programmes/horizon2020/en>. [Accessed 26 May 2021].
- [20] Melnyk BM, Fineout-Overholt E, Fischbeck Feinstein N, Li H, Small L, Wilcox L, et al. Nurses' perceived knowledge, beliefs, skills, and needs regarding evidence-based practice: implications for accelerating the paradigm shift. *Worldviews Evidence-Based Nurs* 2004;1(3):185–93. <https://doi.org/10.1111/j.1524-475x.2004.04024.x>.
- [21] Zhu Z, Xing W, Hu Y, Zhou Y, Gu Y, Cheng L, et al. The construction of evidence dissemination platform based on mobile terminals and the status of the consumers' demand and experience. *J Nurs Training* 2017;32(10):939–41. <https://doi.org/10.16821/j.cnki.hsjx.2017.10.029> [in Chinese].
- [22] Cochrane. Cochrane COVID-19 survey. 2020. <https://hongkong.cochrane.org/news/what-type-covid-19-evidence-most-useful-you>. [Accessed 26 May 2021].
- [23] Cochrane. Cochrane knowledge translation framework. 2017. <https://community.cochrane.org/sites/default/files/uploads/Cochrane%20Knowledge%20Translation%20Framework%281%29.pdf>. [Accessed 26 May 2021].