Nurses' Use of a Web-Based National Guide for Child Health Care

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Rikshandboken i Barnhälsovård is a Swedish Web-based guide for child healthcare, providing quality-ensured guidelines and support contributing to equality in child healthcare among all children. In 2015, a new child healthcare program was implemented and made available in this Web-based guide. The aim of this study was to investigate how child healthcare nurses use *Rikshandboken i Barnhälsovård* and factors affecting its use. The study was a comprehensive Web survey of 2376 child healthcare nurses in Sweden answered by 1309. Statistical processing was performed using descriptive and analytical methods. *Rikshandboken i Barnhälsovård* was widely used by the respondents, but regional differences and number of years in the profession affected the use. Almost all nurses were satisfied with the usability, content, and design and felt that a national guide for child healthcare is important. This indicates that an established Web-based national guide is an appropriate setting when a new national program is implemented. In order to achieve an equal and equitable child healthcare, it is essential that all nurses use the national guide to provide evidence-based practice. The value of main child healthcare units as regional facilitators in the innovation process of *Rikshandboken i Barnhälsovård* should not be underestimated.

KEY WORDS: Child health, Decision support, Information technology, Innovation, Nurses

In 2006, the Swedish National Information Technology Strategy for Health and Social Care¹ was published, declaring the need for implementation of information and communication technologies (ICTs) in healthcare organizations in order to provide safe and accessible care. Information technology-based knowledge support for professionals was highlighted. About the same time, a Web-based national guide, The National Guide for Child Health Care

(in Swedish, *Rikshandboken i Barnhälsovård*, or RHB),² was introduced to provide a current and quality-ensured knowledge base on young children's health and development, as well as methods and guidelines for professionals in child healthcare (CHC). In 2015, a new Swedish national CHC program is available on RHB. Together, the guide and the program aim to create opportunities for an equal and equitable CHC to be offered across the whole country and contribute to evidence-based practice. An essential prerequisite to achieve these aims is that CHC professionals use RHB and the national CHC program. Even though the use of ICT in the healthcare sector is increasing, it is not advancing fast enough, according to several studies as well as the Swedish strategic plan for eHealth.³ For further implementation of the new program, it is important to examine the acceptability and usability of the Web-based guide as well as the factors influencing the adoption of such innovation.

Child Healthcare

Child healthcare, in any form, is available in most countries throughout the world, although its level and coverage vary.^{4,5} In Sweden, CHC is offered free of charge to all children from 0 to 5 years of age, and the participation rate is nearly 100%. The strategy for CHC is to provide a universal program on equal terms among all children in the country. This is an important basis for CHC that enables selective and indicated support to families and an equitable CHC. The different living conditions for families affect children's health and can lead to differences in the child's social status related to health, that is, the child's social gradient.⁶ By providing universal, selective, and indicated support that is in proportion to the degree of vulnerability of families, the social gradient related to health can be reduced.⁷ The aim of CHC is to contribute to children's physical, mental, and social health, promoting children's health and development, preventing illness, identifying problems early, and initiating actions to counteract such problems.⁸ Child healthcare offers a combination of universal, selective, and indicated activities at CHC centers and via house calls, health guidance, health examinations, immunizations, and parental support.⁸

In 2008, the Swedish National Board of Health and Welfare (NBHW) rescinded its national instruction for CHC, and consequently, CHC was left without national guidelines.

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This entailed each county council/regional board specifying its own requirements, tasks, and obligations in relation to CHC, complying more or less with the formal guidelines. Studies show that this autonomy for the county councils has led to regional differences resulting in a lack of equality and equity in CHC today.^{6,9} Each county council runs a main child healthcare unit (MCHCU) with at least one chief medical officer and a coordinating nurse (CHC coordinator). They work to improve local CHC by educating and supporting professionals at CHC centers. Annual follow-ups and evaluations of activities are conducted. The managers at CHC centers have a responsibility to ensure that the local CHC targets are met. The work at CHC centers is led by CHC nurses, who are specialists in either primary healthcare or pediatric care.⁸

Nurses and Internet Use

In relation to clinical decision-making processes, it is important that nurses are able to work in accordance with current guidelines, keeping abreast of new knowledge and having access to timely information.¹⁰⁻¹² The Swedish National Strategy for eHealth¹⁰ states the need for healthcare professionals to have access to well-functioning electronic decision support mechanisms in order to ensure high-quality care and safety, as well as to facilitate the work. The term eHealth is used in the healthcare domain to refer to ICTs that allow the capture, storage, processing, and exchange of information plus communication via electronic means.^{10,13} Internet support facilitates speedy retrieval of health information, evidence-based practice, and patient education. According to O'Leary and Mhaolrúnaigh¹⁴ and Clarke et al,¹⁵ nurses tend to rely heavily on their experiences or to ask colleagues for advice, rather than performing individual searches for information, although the use of Internet to search for information is increasing. This makes it relevant to investigate the use of the Swedish Web-based RHB, containing the most recent recommendations for professionals in CHC.

The Swedish National Guide for Child Health Care

The Swedish RHB² was established in 2005 as a Web-based guide for professionals in CHC. Since 2012, it has also been mobile phone compatible because of a new, responsive design. The RHB aims to create opportunities for an equal and high-quality CHC to exist across the country, offering common guidelines to CHC professionals. The RHB began as the initiative of the Swedish Paediatric Society. Initially, the RHB was a password-protected Web site, exclusively for professionals, available via a previous Web site for parents. Inera, a company funded by the Swedish Association of Local Authorities and Regions, is in charge of coordinating Swedish eHealth work, and it took over the responsibility for the RHB in

2011. At that time, the RHB was given its own open-access Web site, www.rikshandboken-bhv.se.

The RHB contains a program for CHC, knowledge base, methodological guidance, educational materials, information for parents, and references with links to further reading. It has been written and developed by authors with different specialties: pediatricians, CHC nurses, psychologists, speech therapists, nutritionists, and others, all invited to contribute by an editorial board consisting of representatives from the county councils' MCHCUs. All the content is based on the United Nations Convention on the Rights of the Child, laws, general advice, national guidelines, and current policies. It is continuously updated and is written to reflect the latest evidence-based policies, experience-based knowledge, and consensus discussions.²

The use of the RHB has increased fivefold in 3 years. The number of individual visits to the Web site during the period January 1 to July 31, 2012, was 103 645, whereas during the same period in 2013, the figure was 297 295, rising to 517 097 in 2014 (statistics provided by the chief editor of RHB). Although the RHB is a Web site with open access, it is primarily aimed at the professionals in CHC, and the majority of visits can be attributed to the 2376 nurses who were working at the CHC centers at the time of the study.

In April 2014, the NBHW published new guidance for CHC. This is intended to provide general descriptions and frameworks for CHC,⁸ whereas the RHB gives concrete advice for CHC professionals in their everyday work. Representatives from the county councils' MCHCUs have worked in collaboration with the NBHW to develop a new national CHC program, which has been available on the RHB since autumn 2014 and will be implemented in the county councils across the country during 2015-2016. Together, these tools provide a common basis for CHC, with the aim of creating an equal and equitable CHC and contributing to evidence-based practice.⁸ Accessibility to the RHB and the acceptability and usability for this structured support service during daily work at CHC centers have not yet been studied. This information must be important, considering that RHB has been chosen as the setting for the new national CHC program.

Implementation and Innovation

The RHB is not a new Web-based guide, but it could be perceived as new by individual CHC nurses who have not previously encountered the Web site. It would therefore represent an innovation for them. An innovation is an object, idea, or practice that is apprehended as new by its users.¹⁶ In innovation research, implementation refers to the efforts that are made after a decision about the introduction of an innovation.¹⁷ Thus, the implementation of the RHB may be seen as one stage in a longer process that has the end goal to integrate the innovation of RHB into

everyday work. Using a theory of innovation can give an explanation and facilitate the understanding why a particular result is obtained by the diffusion of RHB. Rogers¹⁷ Diffusion of Innovation Theory is a widely used theoretical framework especially in dissemination of technological diffusion and adaptation. According to Rogers,¹⁷ individuals such as CHC nurses can be in different stages: the knowledge stage, persuasion stage, decision stage, implementation stage, or the confirmation stage, in relation to an innovation process. In the context of the RHB, the innovation-decision process starts with knowledge of the Web site's existence. In the persuasion stage, the CHC nurses must be convinced of the value of the RHB. This leads to a decision to use the Web site, which creates the foundations for the implementation stage, in which the CHC nurses must find a use for RHB in everyday working life in order for it to be accepted. Depending on the success of the innovation process, the CHC nurses will then decide whether to use the system fully or whether to abandon it altogether.¹⁷

According to Rogers,¹⁷ CHC nurses' decisions about whether to adopt the RHB can be influenced by a number of factors. One consideration is the degree to which the RHB is perceived as better than the local guidelines that are available on internal Web sites or in print, which RHB is supposed to supersede. Another influencing factor is whether the CHC nurses find that the RHB actually fulfills their requirements for a common Web-based guide. Other points include CHC nurses' existing values, their experiences with the RHB, and ease of use of the Web site. Limited opportunity to experiment with the RHB also influences adoption, as well as the extent to which the innovation provides tangible results—in this case, an equal CHC. The functions and availability of the RHB are communicated through a number of channels: MCHCUs, RHB newsletters, and word of mouth in a social system of CHC centers and county councils. According to Rogers,¹⁷ opinion leaders claim informal leadership, have a unique position in their systems' communication structures, and are able to influence other individuals' attitudes toward the RHB. Change agents, who act as a bridge between technical experts and their clients, work proactively to create demand for the RHB, reducing barriers, supporting adoption decisions, and persuading adopters (ie, nurses).¹⁷

Several studies have explored different factors influencing the implementation of ICT and Internet use in health-care.^{13,15,18–20} Such implementation is influenced by various factors, including availability, clinical relevance, attitudes, time set aside for the purpose, and knowledge of how information can be sought online. When looking at the use of ICT from an organizational perspective, a key component for successful information technology adoption in health-care organizations is the engagement of clinical leaders in

the process as well as the culture, structural and electronic resources, and a supportive environment.^{16,20} For the end users, the design and usability are crucial factors in the acceptance and use of new technological innovations.^{13,18}

As the new national CHC program is introduced, it is important to note that this could also be perceived as an implementation of an innovation: the RHB. The prerequisite for utilizing the new national CHC program is the use of RHB content and the methods it provides. Prior to the implementation of the new national CHC program, it is important, therefore, to gain a deeper understanding of how the RHB is used for knowledge acquisition and methodological guidance, as well as of the frequency of use. The aim of this study was to investigate how nurses in CHC use the RHB and factors affecting its use.

METHODS

Participants

The study was a comprehensive Web survey²¹ conducted from May to September 2013, including all the nurses working at CHC centers in Sweden at the time (2376 people). E-mail addresses for the nurses were collected from the MCHCUs in each of the 21 county councils/regions. An information letter was sent to all CHC center managers. If the center manager did not decline to participate, then the CHC nurses were sent an e-mail request to take part in the survey. Four reminders were sent by e-mail. A nonresponse analysis²² was conducted through telephone interviews with 20 randomly selected nurses who had not responded.

Data Collection

A Web questionnaire,²³ developed in the online survey tool Textalk Web Survey (Textalk AB, Mölndal, Sweden), was used. The questionnaire contained 28 questions with structured response options, including single, multiple choice, and scale questions.²² In seven questions, an opportunity to add comments was provided. The questionnaire consisted of three parts: background variables and questions about the respondents' computer and Internet use, questions about the acquisition of knowledge and methodological guidance, and questions about the use of RHB and the factors that respondents felt were relevant for the use of a Web-based national guide for CHC. Questions about the accessibility of RHB as well as the Web site's content, design, and its usability were included. To strengthen the validity and reliability of the survey, several questions were taken from or based on a relevant selection of the questions used in the Swedish version of the WIP Common Questions used in the World Internet Project (<http://www.Internetstatistik.se/wordpress/wp-content/uploads/2015/08/CommonQuestions-Bogota2013.pdf>). A pilot test of the Web questionnaire was conducted using five respondents working in CHC, which

led to minor changes being made prior to sending it to the participants in the study. Each questionnaire was coded with an identification number to identify the study participant.

Data Analysis

Data analysis was performed using SPSS 22.0 (IBM, Armonk, NY). Statistical processing of the results was performed using descriptive and analytical methods.²¹ The descriptive variables were analyzed with proportion analysis and crosstabs. A χ^2 test was used to determine whether the relationships that emerged in the crosstabs were statistically significant.²¹ A backward logistic regression was conducted to determine whether independent variables influenced the frequency of RHB use by CHC nurses.²¹

Ethical Considerations

An advisory statement was obtained from the Ethical Review Committee of the Southeast (D.nr. EPK 160-2013). The present study was conducted in accordance with the ethical principles for the humanities and social sciences.²⁴ All the participants received information by letter about the study, which guaranteed confidentiality and indicated that participation was voluntary and could be terminated at any time.

RESULTS

The results are presented in accordance with the three parts of the questionnaire: background variables and questions about using the computer and Internet, questions about the acquisition of knowledge and methodological guidance, and questions about the use of the RHB and factors that the respondents felt were relevant for using a Web-based national guide for CHC.

The questionnaire was answered by 1309 CHC nurses, a response rate of 55%. The number of missing values in the questionnaire was less than 1%. Only seven of the respondents were male; thus, no comparison between the sexes was made. The six healthcare regions were represented to different degrees (Table 1). The majority of the CHC nurses who participated belonged to the age group 41 to 50 years (Table 1). Because only 12 of the nurses belonged to the youngest age group, 21 to 30 years, this group was combined with the 31- to 40-year age group in the analysis. The nurses' experience of working in CHC ranged from less than 5 years to more than 20 years (Table 1). Almost all the nurses had access to a computer with an Internet connection both at home and at their CHC center (Table 1). The majority used the Internet almost every day either at work or for leisure purpose. Only a few nurses had access to the Internet via smartphones at work.

The county council-run MCHCUs were the most commonly used source of knowledge and methodological

Table 1. Variables From the Questionnaire, Which Were Included in This Study

Demographic Characteristics	n = 1309, n (%)
Healthcare regions	
Southern healthcare region	335 (26)
Southeastern healthcare region	156 (12)
Western healthcare region	211 (16)
Stockholm/Gotland	184 (14)
Uppsala/Örebro	283 (22)
Northern healthcare region	140 (11)
Age groups, y	
21–30	12 (1)
31–40	251 (19)
41–50	442 (34)
51–60	421 (32)
61–70	183 (14)
Experience as a CHC nurse, y	
<1–5	467 (36)
6–15	502 (38)
16 to >20	340 (26)
Use of computer and Internet	
Access to a computer with Internet connection at home	1271 (97)
Access to a computer with Internet connection at CHC center	1307 (100)
Using Internet almost every day at work or at home	1203 (92)
Access to Internet via smartphones at work	112 (9)
Have received computer training	829 (63)
Have received training in Internet use	349 (27)

guidance for the CHC nurses' work (Table 2). The other four most common sources were colleagues, Internet, one's own experience, and internal Web sites/intranet systems. On the Internet, the most common Web site used by CHC nurses to obtain knowledge was the RHB (94%). The RHB was also the Web site used most often for methodological guidance (88%). Other Internet sources included various government-run and official Web sites.

The existence of a common guide for all professionals working in CHC in Sweden was considered to be important or very important by 99% of the CHC nurses. This answer did not differ between those who were low-frequency or high-frequency users of the RHB. Nearly of all the respondents (98%) also thought it was important or very important to have a common national CHC program.

The RHB was used by 99% of the CHC nurses in varying frequencies (Figure 1). Of the low-frequency users, 86% ($P \leq .05$) used the Internet nearly every day, and 63% ($P \leq .05$) used the Internet to search for knowledge related to their CHC work. The low-frequency users of the RHB were more likely to use their experience to obtain knowledge (77%) ($P \leq .05$) than the CHC nurses who were high-frequency users

Table 2. The Five Most Common Sources Used to Gather Knowledge and Methodological Guidance

Source	Knowledge Guidance (n = 1309), n (%)	Methodological guidance (n = 1309), n (%)
Main CHC unit	1216 (93)	1198 (92)
Colleagues	1030 (79)	793 (61)
Internet	937 (72)	637 (49)
Own experience	929 (71)	564 (43)
Internal Web site/intranet system	819 (63)	712 (54)

(67%) ($P \leq .05$). The respondents with the least amount of experience as CHC nurses used the RHB most frequently; the frequency decreased with increasing time in the profession. Respondents with the longest experience were the least frequent users of the Internet to obtain knowledge. However, when they did use the Internet, the Web site that they used most frequently was the RHB. The proportion of high-frequency users ranged from 38% in Stockholm/Gotland healthcare region to 55% in the Southeastern healthcare region. A multivariate analysis (Table 3) using a backward logistic regression showed a higher odds ratio for low-frequency usage of the RHB if the CHC nurses belonged to the Southern, Northern, or Stockholm/Gotland health region or had longer experience in their profession.

The main reasons for using the RHB were to confirm existing knowledge (86%) and to seek new knowledge (83%). Less important was obtaining methodological guidance (53%). Of the organizational factors, time required to access the system (79%), support from the CHC coordinator (62%), and support from CHC center managers (61%) were considered to have high or very high importance in relation to the use of RHB. Less important was to have access to RHB via mobile

High-frequency users = use RHB several times a week to several times per day
Medium-frequency users= use RHB several times a month to once a week
Low-frequency users = use RHB once a month or less.

FIGURE 1. Child healthcare nurses' use of RHB.

Table 3. Factors Related to Low-Frequency Use of RHB by CHC Nurses

Variables	OR	95% CI for OR	
		Lower	Upper
Southeastern healthcare region	1000		
Southern healthcare region	1638	1107	2425
Western healthcare region	1522	993	2333
Stockholm/Gotland	2133	1363	3336
Uppsala/Örebro	1153	772	1724
Northern healthcare region	1810	1125	2912
Age group 21–40 y	1000		
Age group 41–50 y	966	697	1339
Age group 51–60 y	823	596	1192
Age group 11–70 y	1451	879	2396
<5 y in the profession	1000		
6–15 y in the profession	1905	1437	2525
16 to >20 y in the profession	2364	1606	3480

Abbreviations: CI, confidence interval; OR, odds ratio.
OR value indicates risk to belong to the group who used RHB less than once a month.

phone or tablet. Approximately half (54%) of the CHC nurses found this was of little or no importance.

The results showed that most of the CHC nurses were satisfied with the RHB's usability, content, and design. Almost all of the nurses trusted the information on the RHB and considered RHB content to be of high quality. Fewer nurses were satisfied with the usability of the functions as one-third of the nurses did not feel it was easy to find what they were looking for on the RHB (Table 4). More than 85% of the nurses considered the print-out function, information for parents, educational materials, and overview of the CHC program as the most important components on RHB to use the Web site. Links to databases for information seeking were considered as important of 77% of the nurses. Less important were references for further reading (70%), ability to read frequently asked questions about CHC (70%), link to

Table 4. CHC Nurses Satisfaction With Usability, Content, and Design of RHB

Satisfaction With Usability, Content, and Design	Agree Completely or Largely (n = 1309), n (%)
RHB almost always has the information that is needed	1090 (78)
Trust that the information on RHB is correct	1232 (94)
RHB's content is of a high quality	1167 (89)
The information is pedagogical and easy to interpret	1139 (87)
Satisfaction with the Web site's appearance	947 (72)
Easy to find requested information	902 (69)

the county councils local guidance (69%), and instructional videos for professionals (68%).

DISCUSSION

The aim of this study was to investigate CHC nurses' use of the RHB and factors that affect its use. The results show that the RHB is used by nurses in all healthcare regions; they are satisfied with the Web site and considered it to be important with a common guide for CHC. The factors that influence their use of the RHB were also revealed.

The majority of the CHC nurses use the Internet almost every day, either at home or at work. Even the Annual Study of Swedish People's Internet Habits 2014 shows that Sweden is one of the countries with the highest number of Internet users—more than 90% of people between 6 and 65 years old and 79% in the age group 66 to 75 years.²⁵ The CHC nurses in this study used the Internet neither more nor less than the general population; hence, a lack of computer and Internet experience should not be a barrier to their use of the RHB. The majority of CHC nurses pointed out that time was an important factor in relation to their use of the RHB. A lack of time is a large barrier to the utilization of online services, as identified in previous studies.^{13,15,19}

In recent years, access to the Internet via smartphones and tablets has increased, complementing desktop and laptop computers.²⁵ According to Moore and Jayewardene,²⁶ the use of smartphones is increasing in healthcare, and their potential benefits are recognized by healthcare professionals. Even if the RHB is mobile phone compatible, this facility could be used by only a few of the nurses, as smartphones were not available at work. More than half of the nurses considered that such solutions had no or small importance for the use of the RHB. When 73% of the Swedes today are using smartphones and 69% connecting to Internet via smartphones,²⁵ these results are surprising and raise questions why CHC is lagging behind in this area of ICT. These conditions may explain why Swedish nurses have not discovered the RHB's full potential benefits yet. Because the RHB is mobile compatible, a tablet or a smartphone could have great significance for CHC nurses, making access to the RHB Web site possible during house calls and at parent groups and thereby use knowledge-based information, guidelines, and educational materials.^{10–12} To support the nurses' adoption process from persuasion to decision and usage of the RHB in smartphones or tablets, it is of great importance to improve the usability,¹⁷ as well as giving nurses information on the use of the RHB and access to the Web site via mobile solutions such as smartphones and tablets at work. This should be the responsibility of the MCHCU and the managers at CHC centers. Difficulties in searching for information on the Internet depending on limited access to

computers and a lack of experience/skills were not evident in this study, contrary to other studies.^{15,18–20}

Even though there were more high-frequency than low-frequency users of the RHB in all the healthcare regions, and the Web site was stated as being the most utilized Internet resource for acquiring knowledge and methodological guidance, there were differences in the nurses' use of the RHB, evident at both the individual and regional levels. This is an interesting result, as previous studies^{6,9} have shown that there are regional differences resulting in a lack of equality and equity in Swedish CHC. The differences in rates of adoption for the RHB in different healthcare regions cannot be explained only by individuals' behavior. The social structure of CHC affects the diffusion of the RHB in several ways; the norms, the roles of opinion leaders and change agents, the types of innovation-decisions, and the communication structures have an impact.¹⁷ According to Nilsson et al,²⁷ there are three social challenges in the implementation of electronic information systems. The first is "power" with change of existing hierarchy and alienation. The other is the "professional identity" in which nurses' call and being experts in nursing but novices in information systems lead to problems with their identity. The third social challenge, "encounter," is characterized by poor introductions of electronic information systems and nurses' preconceptions based on previous bad experiences with such systems.²⁷ This highlights the importance of facing the challenges and continued local efforts in county councils/regions to remove barriers and facilitate the use of RHB, especially so that the new CHC program can be followed.

The results indicate that the MCHCUs are the sources which most of the respondents use for knowledge acquisition and methodological guidance. Furthermore, support from the CHC coordinators is an important factor in relation to CHC nurses' use of the RHB. These findings indicate that MCHCUs play a significant role in influencing nurses' attitudes toward the use of the RHB. Although the MCHCUs do not have personnel-related or operational responsibilities, they work closely with the CHC nurses and center managers for continued improvement, support, and education. This places high demands on MCHCUs to keep abreast of research and development in the field, which requires staff availability and expertise. In addition, the MCHCUs have a responsibility to disseminate knowledge, provide support, facilitate the use of RHB, and remove barriers in their county councils/regions, as opinion leaders and change agents.¹⁷ Further consideration of the role of MCHCUs and CHC coordinators as opinion leaders and change agents in future studies—and, in particular, of their potential to ensure the diffusion of the RHB and the implementation of the new CHC program—must be very valuable in providing a deeper understanding of technology innovation processes connected with new technologies in CHC.

The CHC nurses in this study stated that they tend to rely on their experience or to ask their colleagues when seeking knowledge and methodological guidance in their work, which is consistent with results of previous studies on information retrieval by O'Leary and Mhaolrúnaigh¹⁴ and Clarke et al.¹⁵ At the same time, the CHC nurses considered references to further reading and links to databases for information retrieval as important for their usage of the RHB. In recent years, there has been a considerable focus on the use of evidence in health care. A literature review by Clarke et al.¹⁵ shows that nurses are concerned that colleagues' recommendations may not be evidence based. The findings of this study raise questions about whether the results point to a change in nurses' attitudes when it comes to seeking evidence within their work. The CHC nurses turn to the RHB to acquire knowledge and methodological guidance. Prepackaged guideline formats can make research-based evidence more accessible to nurses.¹⁴ This places high demands on RHB management to improve and update the Web site continually when new knowledge emerges, thus enabling CHC nurses to trust the content. Even if a high percentage of the CHC nurses were satisfied with the content, that the RHB almost always has the information that they needed, and that the information is pedagogical and easy to interpret, one-third of the nurses did not feel it was easy to find what they were looking for on the RHB or were satisfied with the Web site's appearance. These are important areas of development. Otherwise, there is a risk that the confidence of the nurses in RHB will be lost, and the technology will no longer be accepted and used as intended.

The CHC nurses in the study with the most years in the profession tended to rely on their experience when it came to knowledge and methodological guidance, and they used the RHB less than less-experienced colleagues. However, when seeking information on the Internet, even this group preferred the RHB over other Web sites. This may indicate that it is not the RHB as such that constitutes a barrier, but rather the concept of using ICT and Web-based sources for information retrieval. The rather low use of RHB and tendency to rely on personal experiences among the CHC nurses in the study with the most years in the profession may indicate that these nurses believe that they do not need to search for knowledge and methodological guidance. One pitfall could be that these CHC nurses continue to work on the basis of outdated advice, without keeping abreast of developments in available knowledge; it is important to pay special attention to this group in the implementation of RHB and the new national CHC program. Regardless of the number of years in the profession, there are national and regional requirements for nurses to keep up to date with new knowledge and to work in accordance with current guidelines.¹⁰⁻¹² The RHB represents a new technology,

and the nurses may feel like beginners, although they are experienced in their profession.

This study was conducted as a comprehensive survey of all nurses working at CHC centers in all healthcare regions in Sweden at a particular time. The difficulty with a comprehensive survey is that it can be extensive and costly.²¹ The use of e-mail and Web surveys²³ made it possible to conduct the survey in a reasonably cost-effective manner. The county councils' MCHCUs provided contact information for all the CHC nurses and their managers, which was an important prerequisite for conducting a comprehensive survey. The response rate of 55% for this study can be considered acceptable to be a Web survey, according to Polit and Beck.²⁸ As such, it can be supposed that a sufficient number of responses were received to give a reliable picture of CHC nurses' use of RHB.

The pilot test of the Web questionnaire was conducted using five respondents who were known by the researcher, working as CHC nurses or at the MCHCUs, which required only minor changes in the questionnaire. A pilot test of more respondents who do not have a professional relationship with the researcher could have identified more weaknesses and provided more critical reflections to strengthen the validity. Several of the questions were based on relevant questions used in the Swedish version of Comment Questions used in the World Internet Project, which strengthens the construct validity. Possibly some questions could have been differently formulated to better capture the implementation barriers.

The external loss affects the validity of a study and, in this case, raises questions about how the CHC nurses who did not respond utilize the RHB. One potential area of bias that arises from the use of such a Web survey is that nurses who did not answer the questionnaire might not use the computer and Internet as much as their colleagues. Nonusers of the RHB would be representative, therefore, of the external loss. There was no indication in the failure analysis of a skewed distribution, however, which supports the reliability of the results. Failure analysis via telephone interviews showed that the most common reason for CHC nurses not responding to the survey was a lack of time. Another reason was the receipt of requests to complete a number of other surveys. The questionnaire was sent during the summer holiday period, which may also have affected the response rate. Some of the nurses on the list had also ceased to work in CHC, which could be a source of external loss (ie, a number of those targeted did not actually belong to the target group any longer).

The tool Textalk Web Survey showed that 95 of the nurses began to fill out the questionnaire but failed to reach the completion and submission stages. The initial focus on several questions about background variables may have

contributed to this discontinuation. Placing the questions in a different order, therefore, may have increased the response rate. The length of the questionnaire may have also contributed to the external loss.

Rogers¹⁷ Diffusion of Innovation Theory was used as a theoretical framework for the study. There are also other theories and models used to understand innovation, implementation, and adoption of technology in healthcare. To bridge the gap between these, an all-encompassing, integrated technology implementation model has been developed by Schoville and Titler²⁹ in 2015. The integrated technology implementation model is composed of 12 concepts in inner and outer organizational contexts to explicate factors that affect technology implementation in healthcare settings.²⁹ The concepts are adoption, implementation, nature of the innovation/technology, interfacing systems, workflow, users (adopters), leadership, communication, accreditation/regulation, economic environment, facilitators (boundary spanner), and vendor. The integrated technology implementation model could be useful in further in-depth studies about facilitators' role in an innovation process in healthcare, as well as studying how the CHC nurses think that the RHB can be developed to best meet their needs regarding content, usability, and design.

CONCLUSIONS

The RHB is widely used by CHC nurses in Sweden, and the nurses who use this Web-based national guide were satisfied with its usability, content, and design. Almost all felt that it is important to have a national guide for CHC. The result indicates that such an established Web-based guide is an appropriate setting when a new national program is implemented, but it demands continual improvements and updates to the Web site to make new knowledge easy to find. Implementing national guidelines and programs on a Web-based guide is a technical innovation where usability and design are crucial factors in the acceptance and use. In addition, the low use of the RHB via smartphones indicates that availability to new technologies as mobile solutions is an important prerequisite for the use of Web-based guides in their full potential. In order to achieve an equal and equitable CHC, it is essential that all CHC nurses use the national guide to provide evidence-based practice. The value of MCHCUs as regional facilitators in different stages in an innovation process should not be underestimated. To gain a deeper understanding, further research with qualitative studies should focus on end-user request on Web sites content, usability, and design, as well as on the facilitator's role in an innovation process in healthcare.

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