The Use of Networking in Nursing Practice —An Integrative Review

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Abstract: Networking provides access to countless opportunities for nurses and patients and allows them to communicate, interact and collaborate with each other in order to enhance nursing care practice and improve health. The ubiquity of information and communication technologies have the potential to improve access to both health information and services in health care. The authors aim for this study is to investigate the role of networking tools in shaping and improving nursing care practices. An integrative review was conducted and electronic databases of PubMed, Cochrane, Science Direct and ACM Digital Library were searched for studies published between 1985 and 2015. Sixteen articles, based on the use of networking tools in nursing care practice, were included in the review. Data synthesis consists of writing descriptive summaries and thematic analysis of the key findings in the included articles. Different networking tools are currently used by nursing professionals for patient's safety and well-being. These include information technology, telehealth nursing, IT and networking applications, social media networks, miscellaneous interaction networks, internet as a source of information and communication networks. Networking assist healthcare professionals with completing their daily tasks such as teaching patients, monitoring their health, tracking their blood pressure and much more. A variety of networking tools are available for managing chronic disease, diet, and lifestyle choices of patients. However, privacy, security and reliability of exchanged information is extremely important in improving the quality of patient care.

Keywords: nursing collaboration; telenursing; networking; nursing care; nursing practices; social media

1. Introduction

Networking is defined as "*the exchange of information or services among individuals, groups, or institutions*" [1]. It describes interactions and communication activities between individuals, groups, communities and organizations operating in a variety of settings and contexts.

Information and knowledge is a valuable resource and has become the key to success in all fields of life. Communities, organizations, and companies need to understand precisely what information and knowledge will give them a competitive advantage. They then need to keep this knowledge, use it, share it and evolve it across the organization. Information and knowledge need to be managed, used, shared and evolved like a key asset. Gathering information and transforming it into useful knowledge require a great deal of collaboration, networking and focus on the community of practice (CoP) [2].

The community of practice is a model of learning where people or groups of people interact, collaborate and share their experiences and knowledge for a common purpose [3]. They share information, discuss their experiences and learn from each other. The concept of CoP is not new. Since the beginning of history, the human race has evolved and distributed themselves in different communities of practice in order to improve their collective learning.

The use of information and communication technologies grows day by day in all parts of the world. By November 2015, more than 3 billion people were using the Internet globally, representing 46.4% of the world's population [4]. Information technologies and computer networking provide a great facility for quick interaction and collaboration in order to fulfill the ever growing need of CoP in the nursing profession. With the increasing ability of technologies to deliver, on demand and in real-time, sound, videos, text and graphics files, the potential for nurses and health professionals to interact, learn and collaborate is huge. The sooner and the more we begin to explore and use these applications, the better we will do in nursing education and nursing care practice [5].

Globalization and global health issues affect health care practitioners worldwide. It is highly desired for nursing professionals to monitor and interact with patients, collaborate with peers and share knowledge, expertise, and resources to enhance the presence of nursing in primary health care worldwide [6].

Nurses need to adapt to the new ways of communication using information technology. This will not only enhance nurse-to-nurse collaboration but also nurse-to-patient interaction and will improve quality and safety of healthcare [7]. Collaboration means interpersonal interaction or collective action toward a common goal [8,9]. It enables the sharing of knowledge and expertise and improves timeliness, quality and access to a broad range of health care services for individuals, families, and communities. In order for nursing to develop and excel as a profession, professional networking and interaction between nurses need to be strengthened. Such collaboration can help move the profession forward and ultimately improve clinical care [10].

Social media remains one of the popular sources of networking and sharing and is gaining popularity among healthcare professions [11]. Its wise and wide usage in nursing can increase opportunities to communicate, share, and collaborate at professional levels and enhance the quality of nursing care practice.

Telenursing is the use of "technology to deliver nursing care and conduct nursing practice" [12]. Telenursing lets nurses perform their routine work of assessment, planning, intervention and evaluating using technologies such as the Internet, computers, and smartphones. The American Nurses Association has defined telenursing as a subset of health in which the focus is on nursing care practice [13].

Diagnosis of diseases has proven to be successful in [14] where remote interpretation and diagnosis with electrocardiogram results was as good as in person. Similarly, telenursing helps in a situation where patients, after leaving a hospital, often do not follow their treatment plan due to lack of communication, access to facilities, and understanding a complex treatment process that the patient cannot follow without additional guidelines [15].

Telenursing also comes in handy for patients who live in remote areas may not be receiving the quality care that is needed due to [16]. Telenursing increases the productivity of nurses by facilitating remote home monitoring and minimizing barriers to quality health care due to distances and costs associated with it [17].

The author's aim of this study is to investigate the role of networking in shaping and improving nursing care practices. The aim is to highlight all of those methods, techniques, and tools used by nursing professionals that strengthen collaboration and generate new possibilities for the well-being of patients.

2. Materials and Methods

2.1. Design

To identify the role of networking tools in shaping nursing care practice, the integrative methodology outlined in [18] was followed. A well-defined strategy was used to search the existing literature and to analyze and evaluate the data in order to locate relevant research articles. Both quantitative and qualitative reports based on the use of different networking tools by nursing professionals were included. Reporting evidence from diverse sources to guide future practice and policy-making is important [19] since limitations may exist in reviewing single sources of evidence [20].

2.2. Search Strategies and Sources

We did a literature review of the past 30 years (1985–2015), using PubMed, Cochrane, Science Direct, and ACM (Association for Computing Machinery) Digital Library, keeping in mind the fact that our focus is on the role and use of networking in improving nursing care practices. We searched these databases for methods, techniques and tools used for networking in nursing and health care practices. Search was conducted between August 2015 to December 2015 to answer the research question: *what is the role of networking in improving nursing care practices?*. The search strategy was based on a number of medical subject headings (MESH), keywords, and descriptors, with the aim to retrieve as many articles as possible regarding our research question (see Table 1).

Table 1. Search terms used to identify studies.

Database	Descriptors Set
PubMed	("Information Science/nursing" [Mesh] OR "Communication/ methods" [Mesh] OR "Communication/prevention and control" [Mesh] OR "Social Networking" [Mesh]) AND ("Nursing Care" [Mesh] OR "Patient Care Planning" [Mesh] OR "Nursing" [Mesh])
Cochrane	Networking and technology and nurse—networking and technology and nursing and care
Science Direct	(networking) and (nursing care) (Nursing and Health Professions)
ACM Digital Library	Networking AND nursing care

2.3. Inclusion Criteria

Free full texts studies (fully accessible using the library subscriptions of our university), published in the last thirty years (1985 to 2015) in the English language on methods, techniques, and tools used for networking (connecting with peers and patients) in nursing practice and health care were included in the review.
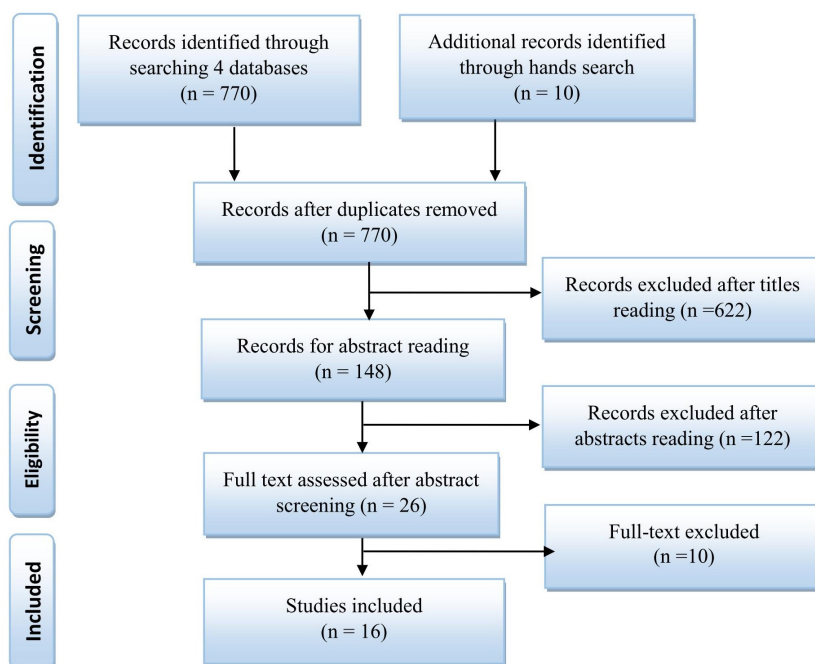
2.4. Search Outcome

A total of 770 articles were initially identified using the search criteria from all the four databases. Similarly, 10 articles were identified through hand search using Google Scholar and searching reference lists. Of these 780 articles, 10 were duplicates. Title screening of the remaining 770 articles resulted in 148 relevant articles being selected for abstract screening. The abstracts of these 148 papers were then examined resulting in 26 papers being examined in full. Of these, the full text of 2 articles was unavailable and 8 were excluded after reading the full texts. In these 8 excluded studies, 4 were based on nursing education, 3 were based on nursing research collaboration and 1 article had unclear methodology and objectives. The remaining 16 studies were fully read and were included in the review as shown in Prisma flowchart in Figure 1. The screening was done by two independent reviewers. Each article was screened by two reviewers and disagreement between them was resolved by discussion. Table 2 presents a summary of included studies.

Table 2. Characteristics of 16 included studies.

Ref.	Study Design	Objective	Networking Tools Studied	Outcome
[21]	Exploratory study—UK	To explores conceptual difficulties which nurses face during their practices	Information Technology	Information technology is important for learning, sharing and collaboration
[22]	Descriptive qualitative—USA	To demonstrate the use of telehealth in remote rural areas	Telehealth Nursing	Successful in monitoring and collaboration in remote areas
[23]	Survey—USA	To explore the role of IT applications in health care	IT Applications	IT Applications lowers the costs while improving the quality of the care
[24]	Descriptive—Finland	To describe the experiences of health professionals about an Internet service	Internet network service (Net Clinic)	Net Clinic increased collaboration and interaction between health professionals
[25]	Descriptive—Australia	To describe the design of the Virtual Critical Care Unit, an advanced telemedicine system	Telehealth and telemedicine	Transmission of high-quality audio and video and seamless interface which works in the complex clinical working environment.
[26]	Grounded Theory—Denmark	To generate a theory by exploring strategies of oncology nurses	Social networks	Trusting and respectful link with patients is beneficial during their treatment
[27]	Exploratory—UK	To understand primary care practitioners' views towards screening for diabetic foot disease and their experience	Computerized decision support system	Primary care clinicians reported good systems in place to screen for diabetes-related complications and to refer their patients to specialist care.
[28]	Quantitative—Taiwan	To assess a mobile care system that enables depressed individuals and caregivers to share mood	Mobile care mediation system	Depressed individuals reduce their reassurance-seeking behavior, but the caregiver burden was also decreased and their relationship satisfaction increased.
[29]	Qualitative content analysis—USA	To explore supportive interaction in online health community	Online forums, journals, and notes	Empirical evidence about the use of different communication tools for information and emotional support
[30]	Cross-sectional—Taiwan	To examine the influence of social network on knowledge sharing and its impact on patient safety	Knowledge sharing networks	Social networks are significantly useful in knowledge sharing and accumulation for nurses and improve patient safety

Table 2. *Cont.*

Ref.	Study Design	Objective	Networking Tools Studied	Outcome
[31]	Cross-sectional—UK	To explore the use of Internet in midwifery practices and by pregnant women	Internet	The Internet enhance knowledge of both nurses and pregnant women
[32]	Qualitative—USA	To understand the role of social interaction and information-sharing	Mobile social and collaborative technologies	Collaborative technologies have the potential to improve both communication and social support for parents of high-risk infants
[33]	Descriptive qualitative—Australia	Explores the use of social media in nurses	Social Media	Positive opportunities for the benefit of nursing, health collaborators, and the people
[34]	Descriptive—USA	To assess a communication network model in relevant infectious disease and safety options	A Communication Network Model	Strengthened communication between care facilities, minimizes cost and performance
[35]	Survey—USA	To explore communication strategies used by healthcare providers	Collaborative communication strategies	Resident-centered care, teamwork, collaboration, and quality is increased
[36]	Descriptive—Australia	To assess the use of social media in nursing practice	Social Networks	Social media help nurses to connect and result in more comprehensive, and accessible care

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│             │   │ Records identified   │   │ Additional records   │
│ Identifica- │   │ through searching    │   │ identified through   │
│ tion        │   │ 4 databases          │   │ hands search         │
│             │   │ (n = 770)            │   │ (n = 10)             │
└─────────────┘   └──────────────────────┘   └──────────────────────┘
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Figure flowchart:

- Records identified through searching 4 databases (n = 770)
- Additional records identified through hands search (n = 10)
- Records after duplicates removed (n = 770)
- Records excluded after titles reading (n = 622)
- Records for abstract reading (n = 148)
- Records excluded after abstracts reading (n = 122)
- Full text assessed after abstract screening (n = 26)
- Full-text excluded (n = 10)
- Studies included (n = 16)

Side labels: Identification, Screening, Eligibility, Included

Figure 1. Flowchart showing the process of identification and screening of studies.

2.5. Quality Assessment

It is always difficult to evaluate the quality of diverse primary sources in a meaningful way [18]. The methodological quality assessment was not performed in this review because the assignment of such assessment scores in heterogeneous studies is an "arbitrary and unscientific" process [37]. Tools like [38] and the Joanna Briggs Institute (JBI) were used to assess the quality of included studies. However, study quality was not summarized due to the inherited methodological complexity [18].

2.6. Data Extraction and Synthesis

Extracting and synthesizing data from heterogeneous sources is a complex process [39]. All 16 papers were independently assessed by two authors. The following information was extracted from each study:

–　Information about authors, journal, publication date, country and language
–　Research design, location, participants, aim
–　Sampling method, sample size
–　Methods, techniques and tools used for networking in nursing practice and healthcare.
–　Results and descriptive summaries of numerical data.

Synthesis of the data involved categorizing networking tools and techniques by their characteristics, narrating and summarizing its use and effects, and presenting data visually.

First, networking tools and techniques identified in this review were extracted and tabulated along with their definition, characteristics, and other details. These networking tools and techniques were then categorized and related to each other on the basis of its nature, characteristics, and potential users. Categories were then formed and presented in the discussion section along with necessary details.

3. Results

Among the 16 studies included in the review, two were cross-sectional, one was a grounded theory, six were descriptive qualitative, one survey study, one qualitative content analysis, one mixed method study, two were qualitative using semi-structure interviews, one exploratory study, and one

based on constructivism theory. Four studies were based in the UK, three in Australia, three in the USA, two in Taiwan and one in Denmark, Finland, China and France each.

The included studies used different types of networking tools and technologies by nursing professionals for patient's safety and well-being. Based on the nature of collaboration and potential users, three categories were formed: "*Collaboration between Health Professionals*", "*Nurse-to-Patient Interaction*" and "*Patient-to-Patient Interaction*". Similarly, based on the characteristics of networking tools, seven categories were formed: *Information Technology, Telehealth Nursing, IT and Networking Applications, Social Media Networks, Miscellaneous Interaction Networks, Internet as a Source of Information and Communication Networks*. A detail discussion on these networking tools is presented in Section 4.

4. Discussion

Networking tools play a central and supportive role in nursing practices and patient well-being. These tools can be divided into three main categories based on the nature of collaboration and their potential users. These categories are: "*Collaboration between Health Professionals*", "*Nurse-to-Patient interaction*" and "*Patient-to-Patient interaction*".

Collaboration between Health Professionals: Collaboration between health professionals is essential to patient safety and facilitates better patients outcomes. Information technology is used in [21] for regulating treatment process, protocols, and nursing care across Europe. Similarly, telenursing such as in [22,25] is used for collaboration between healthcare providers in treating remote patients. Different computer applications and communication networks such as [23,24,27,30,33–35] are used for collaboration and information sharing.

Nurse-to-Patient Interaction: Interactions such as [22,25,36] are used for remote monitoring, educating and consulting patients. Such types of networks avoid frequent hospitalization of patients who live in remote areas and are unable to travel.

Patient-to-Patient Interaction: People often express their feelings in order to get informational as well as emotional support. Interactions such as in [26,28,29,32] enable patients to connect with each other for supportive relationships. People also tend to find peers with similar experiences and to obtain an alternate source of information, besides their physician, to seek personalized information.

Based on the nature and characteristics of the networking tools, seven categories are formed, which are described as follows.

4.1. Information Technology in Regulating Treatment Process and Nursing Care

Information technology can play a huge role in standardizing the treatment process, protocols and nursing care for different diseases across the globe. A Workflow Information Systems for European Nursing Care (WISECARE) was presented in [21] in 1998 in the UK to explore some of the conceptual difficulties that nurses face during their practice. The authors point out that in Europe, cancer is treated in different ways depending on the experience and clinical expertise of the treating physician. The outcome of cancer patients could be much improved if the treatment process is regulated across Europe and information and technical details about treatment are shared and disseminated across the continent. WISEACRE also emphasizes collaborative interaction and information sharing among nurses across the globe for a better outcome of patients.

4.2. Telehealth Nursing

The American Nurses Association define telenursing as a part of telehealth in which the focus is on nursing practice [13]. Nurses who use telecommunications and other health technologies, such as audio and video integrated into their existing nursing practice, are providing telehealth nursing. Telehealth nursing has gained popularity with the recent advancement in information and communication technologies. Studies, such as [22,25], have shown successful implementation of telehealth nursing in remote areas. Telenursing avoids frequent hospitalization of patients who are unable to travel because of illness, age, distance or lack of transportation.

In a descriptive qualitative study [22] conducted in 2001 in the US, telehealth nursing was shown to be successful, especially for patients living in remote areas. Telenursing was used for remote monitoring, educating and consulting patients. In addition, it can be used for conducting and communicating medical tests results, assessment of physicals exams and collaboration with healthcare providers in implementing medical treatment protocols and providing follow-up care. Similarly, in an another study [25] conducted in 2006 in Australia, the design process of the Virtual Critical Care Unit (ViCCU), an advanced telemedicine system, is described. The authors have shown that the system allows an emergency specialist at a major referral hospital to remotely lead and help a clinical team in a small rural hospital during the treatment of critically ill patients. The system enables the transmission of high-quality audio and video and has a seamless interface that works in the complex clinical working environment. The technical design team took an iterative participatory design approach towards the system design. The system was verified by a series of tests by experts and users with different patient scenarios. Their success confirms the viability of such systems in remote rural areas.

4.3. IT and Networking Applications

Information technology is a fundamental asset for health care providers. It provides information and decision support services while keeping the costs low and improving the quality of health services and patient care. Document management systems, databases, distributed networks and other various applications help doctors and nurses in performing their daily routine jobs.

The role of information technology and its application in health care was explored in a survey study [23], conducted in 2002 in the USA. The strategic IT applications reviewed in this study suggest how much IT has become important in the healthcare industry. Use of intelligent systems to automate patient record keeping and provide timely decision support and expert knowledge, lower the costs while improving the quality of care actually delivered. However, proper measures must be taken while storing patient data. Lack of proper controls, security, and policies, might tempt unauthorized and illegitimate access to this information.

Similarly, an exploratory study [27] based on the semi-structured interview was conducted in 2010 in the UK to understand primary care practitioners' views towards screening for diabetic foot disease. Seven nurses and six general practitioners participated in the study. Adoption of the foot assessment tool in primary care is not perceived as clinically important. Although information recorded by specialist services was useful. According to practitioner's interviews, the incidence of foot ulceration in diabetic patients is very low.

A special purpose network service (called Net Clinic) was introduced in [24] in 2004 in Finland. Semi-structured thematic interviews were conducted from five midwives, two public health nurses and three doctors, who were trained in information and communication technologies (ICT) to use Net Clinic. All participants had generally positive attitudes towards Net Clinic as a medium in their own daily work. However, they also considered privacy and reliability extremely important. Different views were expressed about Net Clinic and its implementation, and, therefore, three groups were identified based on their experience of using Net Clinic. First, doubters were not sure about their information and communication technologies (ICT) skills and were reluctant to use Net Clinic. They need guidance to improve their ICT skills. Second, acceptors were satisfied from their working methods, and they agreed that ICT would naturally become a part of maternity-care services and would be accepted eventually. Third, future confident observed ICT as a useful tool for maternity care clinics. They recognized the opportunities of collaboration and interaction that the system could provide.

4.4. Social Media Networks

Social media has changed the way how people communicate. Social media consists of online communication networks, applications, and services through which people interact, communicate, collaborate, share, and discuss ideas globally. Social media includes Facebook, Twitter, blogs, LinkedIn, Google+, YouTube, Instagram and many other websites, applications, and services.

A cross-sectional study [30] was conducted in 2011 in Taiwan, in which 1026 registered nurses and head nurses participated, to examine the influence of social networks on knowledge sharing and its impact on patient safety. The study shows that social networks are significantly useful in knowledge sharing and knowledge accumulation for nurses. They play important roles in knowledge acquisition and experience development that can be used in patient care safety. Collaboration and sharing of knowledge among health professionals are very important for improving the quality of health care, particularly, patient's safety. Administrators and higher authorities should encourage and develop strategies to provide a social networking opportunity for the nurses to interact with each other and share their knowledge.

A descriptive study [33] conducted in 2013 in Australia describes the use of Twitter and its role in developing a professional digital health network. The study highlights the benefits of social media and provides guidance for those who have been reluctant to use social media. The authors discuss the importance and trend towards using smartphones and social media by nurses and other health professionals. It is highly important for health professionals to prepare and adopt themselves to the changing environment in the health sector. The early adoption brings many positive opportunities for nursing, health providers, and people.

A descriptive study [36] was conducted in 2014 in Australia on the use of social media in nursing practice. The authors urge that there are various health-based mobile applications that have been developed to interact with social media to monitor and assess patient data. For instance, an app developed for older adults who want to stay independently at home, while their health will be assessed remotely by a nurse using social networks connected to mHealth enabled device. Similarly, content sharing and web conferences with distance students as well as sharing activities and transferring lectures are also being used by nurses.

4.5. Miscellaneous Interaction Networks

4.5.1. Network-Focused Nursing—Nurse-to-Patient Interaction

The interaction between patients and nurse is important in improving the quality of nursing care [40]. A grounded theory [26] was conducted in Denmark in 2010 to generate a theory by exploring Nurse-to-Patient interaction of oncology nurses in supporting young patients with cancer. Teenagers are extremely vulnerable and dependent on a supportive social network when undergoing treatment. Making a trusting and respectful link with a young adult requires a highly sensitive approach, careful assessment, and cooperation. "Bridging" was defined as a core strategy for nurses which helps to bridge and connect with young patients whenever they feel loneliness and reduce the burden of treatment.

4.5.2. Network-Focused Nursing—Nurse-to-Home Caregivers Interaction

It is always hard for parents to provide quality care to their high-risk infants at home. A qualitative study [32] based on semi-structured interviews was conducted in California in the USA to understand the role of social interaction and information-sharing between home caregivers and health professionals. The study focused on the design of mobile, social and collaborative technologies that enhance ways of communication and social support for parents of high-risk infants. In this case, communication activities are different with family members, friends and health professionals. Lack of proper communication channels further increase stress on already stressed parents and they need social support, especially as they are discharged from the hospital. Lack of appropriate communication between caregivers and parents may lead to mistrust and reduce the quality of care. Mobile collaborative technology can solve these issues by supporting health education, translation, and language issues.

4.5.3. Online Patients Networks—Patient-to-Patient and Nurse-to-Patient Interaction

In today's modern age, people express their feelings and personal information in order to support each other using online social networks. Such an online community of patients enables them to connect with each other to form healthy and supportive relationships. A qualitative study [29] was conducted in 2010 in the USA to explore supportive interaction in the online health community. The data were collected from community forums, journals and notes from 9 June 2009 to 9 September 2009, and content analysis was performed to identify different types of support.

This study provides empirical evidence about the use of different communication tools for information support as well as emotional support. However, people used different communication tools for different purposes. For instance, forums were mostly used for information support, and journals and notes were mostly for emotional support.

People use online communication tools to find peers with similar experiences and to obtain an alternate source of information, besides their physician, to seek personalized information. By listening to others, similar patients and their stories and personal experience, one can discover more insights about their problems.

4.5.4. Mobile Care Mediation System

A quantitative study [28] was conducted in 2010 in Taiwan to propose a mobile care mediation system that enables depressed individuals and caregivers. The system enables participants to share mood and availability information. The system lets users share their emotions by filling out questionnaires, by setting an emoticon, or by showing a picture. However, some participants commented that the information is insufficient to make an accurate assessment. They suggested a better way to express their feelings. In addition to sharing information, the system also acts as an agent that suggests distraction and caring action to both parties. The study shows the viability of mobile technology to be used for communication between depressed individuals and caregivers.

4.6. Use of Internet as a Source of Information

A cross-sectional exploratory study [31] was conducted in 2011 in the UK with an international sample of 303 midwives, to explore the views of midwives on internet use in midwifery practice, and to explore the perceptions of pregnant women using the internet as a source of information. The internet was reported to be used by the majority of midwives in their routine practices. However, it is still a secondary source of information, after professional journals. Almost half of the midwives in this study lacked confidence in referring pregnant women to a specific website. These midwives have concerns about the quality of online content. Most of the participants (98%) frequently examine the quality of the information presented to them by a pregnant woman. However, only 15% were able to name at least one quality indicator used to evaluate online health information.

It is obvious from this study that midwives perceive the internet as a source of information both for themselves and for pregnant women. The rapid growth of the internet may have an impact on the relations between pregnant women and health professionals. Midwives should not feel vulnerable when asked by a pregnant woman who has some internet information. Such awareness should not be considered as a threat to their expertise but should be considered as an opportunity to work together with women to meet their needs. However, the health professional must be able to describe and appraise internet-based health content for quality. Health professionals should develop their skill using internet-based information so that they can be effective in supporting modern information age women.

4.7. Communication Networks

A qualitative descriptive study [34] was conducted in 2013 in the USA on a communication network model for local public health, acute care, and long-term care. In the absence of the

communication network model, health care workers and safety professionals had no opportunity to meet and discuss infection or safety issues. The proposed network provided an opportunity to discuss the relevant infectious disease and safety topics affecting the community, provide best practices and resources for preventing and controlling the infectious disease and its transmission, and identify barriers that delay best practices, and promote interaction and cooperation between organizations and institutions.

A survey study [35] was conducted in 2014 in the USA to explore communications strategies used by health care providers for resident skin risk in a nursing home with high IT sophistication. The study found that IT increases unique interactions and facilitates resident-centered care through enhanced information sharing, a greater virtual collaboration between team members, and improved care delivery. The authors urge that in some cases, face-to-face communication is still preferred and optimal, and this should also be considered in the design and implementation of communication networks in the health profession.

Communication networks strengthened interaction between care facilities and provided a solid foundation on which health professionals can improve transitional care processes to reduce hospital readmissions, helped in the prevention of infectious diseases, minimized health care costs, and prepared facilities for future performance regulations.

4.8. Impact on Patients

Social interaction and networking let patients share their health problems with others and receive an immediate customized response to fulfill their informational and emotional needs, either from healthcare providers or from others members of the public or other patients. Individuals who have similar health problems can form online communities through which they can connect, interact, and share experiences. A national survey conducted in the USA indicates that one out of three adults in the USA has been helped by online medical advice or health information [41]. People use online tools to find someone with similar conditions and to obtain an alternate source of information, personal experience, and more insights about their problems, besides their physicians [29]. Networking and social media tools are also very advantageous for promoting health awareness in communities [42]. In remote and rural areas of the world, telenursing increases access to health care information and services for patients who cannot personally visit hospitals due to illness, age or distance.

4.9. Impact on Nurses

For nurses, networking provides opportunities to dialogue with peers and maintains awareness of recent healthcare developments. This is particularly helpful for those nurses and health professionals who are working in rural or remote areas. International organization may provide opportunities for online talks by nurses from around the globe and arrange discussion forums for students, teachers, researchers and nursing regulators. Nurses can remotely monitor and educate patients, collaborate with healthcare providers in conducting and communicating patient's medical tests results, implement treatment protocols and provide follow-up care. The rich information that results from the interaction on social networks can be used as a very useful resource by healthcare providers. For instance, the use of Twitter$^{\circledR}$ content in predicting and tracking influenza outbreaks [43]. Online forums and social media can be easily used to reach a wide audience and promote a two-way dialogue with public and healthcare professionals. Nurses and health professionals can use it to share links to high quality, reliable health resources with their patients, families, friends, or colleagues, and stay updated.

4.10. Associated Risks with Networking Tools and Social Media

Along with their benefits, there are also some risks associated with the use of networking tools and social media.

Reliability of Content: Reliability and trustworthiness of online content is always an issue. People usually assess the reliability of online health information by looking at their sponsor or by

taking recommendations from health professionals [44]. The potential risk associated with the internet and social media is the distribution of un-moderated distribution of information, which may lead to wrong decisions by both health professionals and the general public.

Privacy and Security Issues: Respecting patient privacy and confidentiality at all times is extremely important in improving the quality of patient care. Breaches of privacy can occur in a variety of ways and may include describing a patient on social networks with sufficient details to be identified or talking about a patient in a degrading or embarrassing way. In a survey [45] conducted by the National Council of State Boards of Nursing (NCSBN), 33 out of 46 state boards of nursing indicated breaches of patient privacy by nurses. Twenty-six of those boards took disciplinary action against those nurses.

5. Conclusions

Nurses need a wide range of theoretical and practical knowledge to provide the appropriate level of care to patients. Their knowledge should be dynamic and continuously evolve. Networking tools facilitate interaction and communication between nurses and patients resulting in comprehensive and more accessible care. On one hand, collaboration between nurses let them get involved and grow their skills and knowledge, while, on the other hand, interaction between nurses and patients results in quality nursing care to patients.

As technology grows, nurses need to understand and adapt the complex ways in which society now communicates. Nurses need to further develop ways to interact, monitor and collaborate with peers and patients. They need to learn how to effectively manage these tools and leverage their benefits. However, several factors need to be taken care of, in order to make IT applications more effective in health care. These include better training and increased awareness of staff regarding the tools and applications used. In addition, the applications also need to be flexible enough to adjust to the changes in routine clinical practices. Last but not least, the privacy, security and reliability of data are extremely important in improving the quality of nursing care practices. Breakthroughs in integrated and intelligent computer and communication systems are highly desired in future health care practices.

We are continuously evolving and so is our knowledge and understanding. Today, we are living in an information age where we have unprecedented opportunities for communication, interaction, collaboration, and sharing. It is essential that nursing and healthcare providers effectively harness the power of these new technologies for global outreach.

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Abbreviations

The following abbreviations are used in this manuscript:

IT	Information Technology
ICT	Information and Communication Technologies
CoP	Community of Practice
MeSH	Medical Subject Heading
JBI	Joanna Briggs Institute
UK	United Kingdom
USA	United States of America
WISECARE	Workflow Information System European Care
ViCCU	Virtual Critical Care Unit

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