Article

Conceptualizing Telehealth in Nursing Practice

Advancing a Conceptual Model to Fill a Virtual Gap

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Increasingly nurses use various telehealth technologies to deliver health care services; however, there has been a lag in research and generation of empirical knowledge to support nursing practice in this expanding field. One challenge to generating knowledge is a gap in development of a comprehensive conceptual model or theoretical framework to illustrate relationships of concepts and phenomena inherent to adoption of a broad range of telehealth technologies to holistic nursing practice. A review of the literature revealed eight published conceptual models, theoretical frameworks, or similar entities applicable to nursing practice. Many of these models focus exclusively on use of telephones and four were generated from qualitative studies, but none comprehensively reflect complexities of bridging nursing process and elements of nursing practice into use of telehealth. The purpose of this article is to present a review of existing conceptual models and frameworks, discuss predominant themes and features of these models, and present a comprehensive conceptual model for telehealth nursing practice synthesized from this literature for consideration and further development. This conceptual model illustrates characteristics of, and relationships between, dimensions of telehealth practice to guide research and knowledge development in provision of holistic person-centered care delivery to individuals by nurses through telehealth technologies.

Keywords: *telehealth; telenursing; telemedicine; holistic; holistic theories and practices; holistic care; holistic nursing; nursing models; practice; theoretical*

Increasing numbers of nurses are using an array of emerging digital technologies in the expanding field of telehealth care as part of regular nursing practice. The rapid pace of adoption, and evolution, of new telehealth technologies has provided little time for nursing to support its practice in this emerging field with adequate research and knowledge to understand resulting changes to nursing practice (Nagel, Pomerleau, & Penner, 2013). Given legal, ethical, and professional imperatives of nurses to provide safe, appropriate, and holistic care to individuals, research and generation of knowledge in telehealth nursing practice is essential to promote

evidence-informed practice for nurses (Canadian Nurses Association [CNA], 2007; Doane & Varcoe, 2007). Such research and knowledge generation may help in understanding and addressing underlying tensions of telehealth technology use in nursing

practice, such as the nature of delivering holistic care in a virtual environment, the competencies required of nurses for telehealth care delivery, and "the complex relationship between nurse, person and technology" (Nagel et al., 2013, p. 110).

To foster scientific discovery and knowledge development in areas of nursing practice, advancement of appropriate conceptual models, frameworks, and theories is necessary to guide focused and rigorous lines of inquiry (Butts, 2011; Meleis, 2007; Polit & Beck, 2012). Few such conceptual entities specific to use of telehealth in nursing practice exist to date, and of those published, none appear to capture a comprehensive perspective of the broad scope of nursing practice and delivery of safe, appropriate, and holistic nursing care using telehealth technologies. A survey of existing conceptual models, conceptual frameworks, and theoretical frameworks specific to telehealth in nursing practice is presented here to illuminate progress in conceptual development in this field. As will be revealed, most current conceptual models and frameworks of practice in telehealth are specific to telephone interventions. Following a brief definition and discussion of telehealth and telehealth in nursing practice, a description and comparison of the existing telehealth models and frameworks of nursing care delivery in the context of telehealth is offered. Finally, given the paucity of comprehensive conceptual models for telehealth nursing practice, a conceptual model is presented for consideration, for further refinement and explication, and for potential use in future scientific inquiry to telehealth nursing practice.

Defining and Describing Telehealth

No singular definition exists for *telehealth*; however, it generally denotes delivery of health care services to persons by distance using a range of different technologies and modalities through a telecommunications system (CNA, 2007; Nagel et al., 2013). The term *telehealth* is often used in conjunction or synonymously with telemedicine, teleconsultation, telehomecare, *e*-Health, and informatics (CNA, 2007; Nagel et al., 2013). For the purpose of this article, telehealth is regarded as remote delivery of health care services using technology and digital communications for assessment, information exchange, clinical decision making, interdisciplinary

collaboration, and/or providing health care interventions to individuals. It is important to note the ability for a health care provider to effectively engage in any or all of these activities in telehealth varies with differences in technology capacity, connectivity, scope of practice, the practitioner's knowledge and skill, and the service delivery model (Hebert, Korabek, & Scott; 2006; Jerome & Zaylor, 2000; Parker Oliver, Demiris, Wittenberg-Lyles, & Porock, 2009; Pecina et al., 2012).

Nurses have used telephone as a form of telehealth to deliver care for decades, and it remains an important and well-utilized modality by providers for a range of services such as triage of health issues; consultation; providing advice, support, and health education; and care coordination (Coyle, Duffy, & Martin, 2007; Greenberg, 2009; Larson-Dahn, 2000; Looman et al., 2012; Purc-Stephenson & Thrasher, 2010). A wider range of telehealth technologies are used today, such as remote patient monitoring (RPM), videoconferencing (VC), and other computer-mediated communications (CMC) like email (Jerome & Zaylor, 2000; Looman et al., 2012; Matusitz & Breen, 2007; Miller, 2002; Pecina et al., 2011).

RPM is used to monitor and support individuals with health challenges, such as diabetes and cardiovascular conditions, and demonstrated to have effective patient self-management and clinical outcomes (Holtz & Lauckner, 2012; Meystre, 2005; Miller, 2002; Paré, Jaana, & Sicotte, 2007; Pecina et al., 2011). In RPM, applications through Internet or mobile devices, such as cell phones, allow individuals to input physiological data like blood glucose, blood pressure, weight, and other information, such as activity regimen or medication usage, that the provider uses to assess wellness or progress in health status (Holtz & Lauckner, 2012; Meystre, 2005; Paré et al., 2007; Pecina et al., 2011). VC technologies, such as videophones and teleconferencing units, facilitate digital face-to-face interactions between individuals and have been widely used in mental health and by specialists in telemedicine to provide clinical assessments, consultations, and direct care, such as therapy in telepsychiatry, for patients (Backhaus et al., 2012; Hilty, Nesbitt, Marks, & Callahan, 2002; Looman et al., 2012; Parker Oliver et al., 2009).

CMC technologies move access to, and provision of, health care beyond traditional boundaries of formal health care systems, such as face-to-face

encounters for care, to more informal virtual settings (Hawn, 2009; Kreps & Neuhauser, 2010; Matusitz & Breen, 2007; Miller, 2002). CMC engagement ranges from direct email communications to web portals for health promotion activities to social networks, such as Twitter and Facebook, for dissemination of information, support, and to influence health behaviors (Kreps & Neuhauser, 2010; Matusitz & Breen, 2007). Benefits of CMC technology include greater access to information and support, affordability, and ability to reach greater numbers of people (Hawn, 2009; Kreps & Neuhauser, 2010; Matusitz & Breen, 2007).

Telehealth and Nursing Practice

Advances in health care knowledge, requirements for efficient care delivery, health care reform, shortages of skilled health care workers, expectations of informed health care consumers, and economic factors have led to increased utilization of technology in health care (Coyle et al., 2007; Nagel et al., 2013). Additionally, in many jurisdictions, geographical disparities in health care resources and demand for better access to care have influenced increased use of telehealth for delivery of health care (Coyle et al., 2007; Looman et al., 2012; Romero, Angelo, & Gonzalez, 2012). In many countries, nurses are more actively engaged in delivery of health care services in telehealth (Care, Gregory, & Chernomas, 2010), and CNA (2007) supports the role of nursing practice in telehealth service as part of an integrated primary health care system.

Further research and knowledge development is needed to generate requisite evidence to support the shift in nursing practice toward increased telehealth use and to promote ethical, safe, appropriate, and holistic care of persons receiving services through telehealth (Nagel et al., 2013). While much literature articulates benefits, challenges, and implementation of providing telehealth services, little empirical work has been done to reflect specific aspects of nursing practice in telehealth, such as professional communications through remote technologies, adapting current nursing practice to technology use, and knowing the person through technology media (Locsin, 2010; Nagel et al., 2013; Purc-Stephenson & Thrasher, 2010; Romero et al., 2012). A particular gap exists in the development of conceptual models and frameworks related to telehealth and nursing practice that highlight holistic person-centered care;

illustrate characteristics of, and relationships between, elements of telehealth and nursing practice; serve to guide research in this area; inform practice and policy; and contribute to the foundation of the nursing discipline and professional identity of the nurse (Butts, 2011; Meleis, 2007; Polit & Beck, 2012).

Review of the Literature

A review of the literature was conducted in the databases of CINAHL, Cochrane Reviews, EMBASE, Medline OVID, Medline®, PsycInfo, PubMed, and Web of Science to identify articles and other sources that articulate a conceptual model, conceptual framework, or theoretical framework of nursing practice in relation to telehealth. In addition to a search of the databases, gray literature was also identified through a manual search of Google Scholar and other sources, including textbooks and known research projects. The main inclusion criteria of this literature review was presentation of a conceptual framework, conceptual model, or theoretical framework that described the delivery of care to patients by nurses using a form of technology that fit within the definition of telehealth provided here earlier. In nursing literature, the terms conceptual frameworks, conceptual models, and theoretical frameworks are often used interchangeably although there are various levels of abstraction and articulation of relationships between concepts associated with each of these entities (Butts, 2011; Fawcett & Desanto-Madeya, 2013; Meleis, 2007; Polit & Beck, 2012). For simplicity of discussion, *conceptual model* is used in this article as an inclusive term as it most appropriately captures the broad essence of phenomena related to nursing care delivered using telehealth and provides both an organizational framework and an abstract visualization of the related phenomena (Fawcett & Desanto-Madeya, 2013).

Combinations of the key terms "telehealth," "telemedicine," "telenursing," and "eHealth" individually with each of the key terms "conceptual frameworks," "conceptual models," and "theoretical frameworks" were used in this search. No date restriction was applied to the search, and publications and sources up to July 2014 were included. Required criteria for review included availability of an abstract, being printed in English, and accessibility of the source in full text. Because of the extensiveness of findings in Google Scholar, only the first
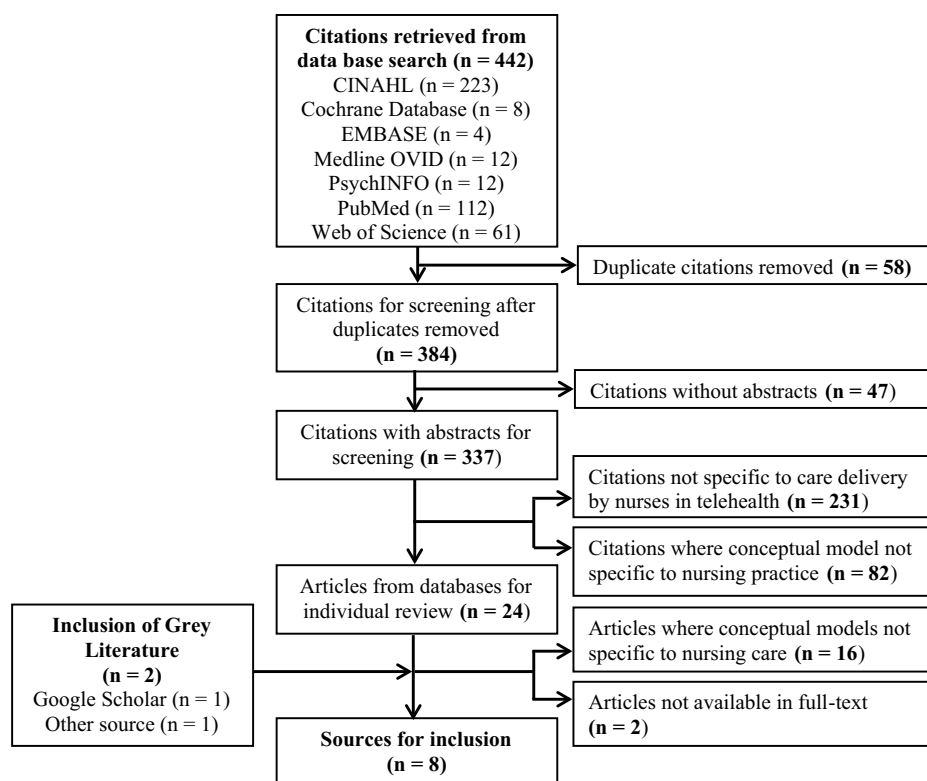
Figure 1.   Process of Literature Search and Review

10 pages of results for each of the combinations were reviewed; many articles reviewed from Google Scholar were redundant to articles already identified in the other databases.

Of 442 citations retrieved from the databases, 58 were removed as duplicates and 47 were removed because of lack of abstracts (Figure 1). Of the remaining 337 citations, 231 abstracts did not reflect explicit nurse involvement in telehealth care delivery, and in 82 abstracts the conceptual model did not reflect delivery of care to patients by nurses through telehealth. The remaining 24 articles were individually reviewed for fit with the main inclusion criteria and of these an additional 16 articles did not reflect conceptual models specific to care delivery by nurses and 2 were not available in full text.

Further review of available "grey literature," including textbooks, conference presentations, and online resources from telehealth and Canadian health profession agencies, yielded one additional appropriate source, and one article was identified through Google Scholar for a total of eight sources applicable to telehealth nursing practice (see Table 1). Of these sources, four were generated from qualitative research studies, six are specific to nursing practice,

two reflect an interdisciplinary approach that includes nurses, and five are specific to telephone use, while three reflect practice using a broader range of telehealth technologies.

Key Themes in Current Conceptual Models of Telehealth

Although few conceptual models related to telehealth and nursing practice have been identified, those available provide valuable insight to the complexity and challenges in describing a holistic care approach to provision of health care through telehealth. By its nature, use of technology risks reducing the whole of the person to parts, potentially creating a sense of distance, and objectifying and depersonalizing the individual receiving care (Barnard, 2009; Locsin, 2009; Sandelowski, 2002; Timmons, 2003). This runs contrary to the way nurses perceive and value delivery of their care (Nagel et al., 2013; Potter & Frisch, 2007; Sandelowski, 2002; Timmons, 2003). A review of the existing conceptual models revealed key themes that have application to nursing practice in telehealth and

Table 1. Literature Review: Conceptual Models, Frameworks, and Theories Specific to Telehealth and Nursing Practice

No.	Authors	Country	Literature Typology	Technology Focus	Contribution of Article or Presentation	Relevance to Nursing Practice in Telehealth
1	Arnaert, Beaulieu, Nagel, and Gabos (2012)	Canada	Poster and conference presentation; Qualitative study	Various e-Health modalities	Conceptual framework of interrelated categories and themes describing competencies required of nurses for telehealth practice	Competencies and competency development in telehealth are integral to nursing practice in this field as is adapting general nursing knowledge and skills to telehealth use
2	Coyle et al. (2007)	USA	Discussion paper	Telephone	Describes the role of nursing students engaged in telehealth in a community setting for the enhancement of self-efficacy and health promotion skills of individuals, using Bandura's Model of Self-Efficacy	Education of nursing students in use of telephone to provide telehealth, and potential broader application for professional development and preparation of current nurse practitioners for telehealth use
3	Greenberg (2009)	USA	Research; Qualitative study (grounded theory)	Telephone	Model of the process of telephone nursing	Components of nursing process, such as information seeking, decision making, and planning
4	Larson-Dahn (2000)	USA	Discussion paper	Telephone	Proposal of a theoretical framework to articulate a practice model for providing nursing care by telephone	Describes the complex process in nursing care provision by telephone, such as decision making, assessment, and the relationship aspect between nurse and patient
5	Looman et al. (2012)	USA	Discussion paper/case report	e-Health records, telephone, and videoconferencing	Description of a model of care coordination that includes use of telehealth technology by advanced practice RNs in the delivery of care to children with complex special health-care needs	Highlights the integration of electronic health records with use of telephone and videoconferencing by advanced practice nurses, including aspects of nursing practice and management of information to enhance delivery of care
6	Parker Oliver et al. (2009)	USA	Review and synthesis	Videophones	Integration of a model of interdisciplinary collaboration and components of team process to inform use of videophones in hospice care	Inform aspects of team process and interdisciplinary collaboration in telehealth nursing practice, which are key to conventional nursing practice
7	Purc-Stephenson and Thrasher (2010)	Canada	Meta-ethnography	Telephone	Presents theoretical framework of decision-making process in telephone triage by nurses	Decision making of nurses engaged in telehealth practice
8	Romero et al. (2012)	Chile	Research; Qualitative study (grounded theory)	Telephone	Development of theoretical model to describe interaction processes in the experiences of nurses and midwives who deliver care by telephone	Highlights the "imaginative construction of care" and development of new communication skills to foster presence and support despite a sense of uncertainty given an absence of physical presence

the potential to address the propensity for reduction of the person, including (a) creating a picture of the person and context in which the person exists; (b) "knowing the person"; (c) having preexisting clinical knowledge and developing requisite competencies for telehealth, such as assessment, communication, and relational practice; and (d) decision-making processes with the person receiving care at the center of telehealth interactions.

"Building a Picture" Through Telehealth

In a meta-ethnography of nurses' experience with telephone triage, Purc-Stephenson and Thrasher (2010) presented a theoretical framework for a decision-making process whereby nurses create "a mental image of the caller and their situation" (p. 490), to determine urgency of the issue and the advice to be provided to the individual. Using a holistic assessment approach in conjunction with strong nursing skills, particularly interpersonal communication and previous clinical knowledge, *Picture Building* is described as a process undertaken by the nurse to inform the final triage decision (Purc-Stephenson & Thrasher, 2010). Similarly, Romero et al. (2012) described *Constructing Interaction with the User* in their grounded theory study of remote care by telephone, whereby the health care professional attempts to construct the person's reality and characterizes a psychological space "where an image of the context and the user him/herself replaces the physical space" (p. 696). This abstract dynamic provides the practitioner a greater sensitivity to the context of the person, while simultaneously creating a perception for the provider of being present to the person receiving the care by telephone (Romero et al., 2012).

"Knowing the Person" in Telehealth

In Greenberg's (2009) grounded theory of telephone nursing, *Getting to Know* the caller is regarded as important so "the nurse is able to grasp the situation and accurately interpret the caller concerns" (p. 2624), and knowing the caller, with respect to the caller's resources and support, is important for planning what needs to be done. In another qualitative study, *Knowing the Person*, a

facet of *Adapting Practice*, was identified as a required competency for nursing practice in *e*-Health (Arnaert et al., 2012). In this study, "reading the patient" through telehealth was noted as part of a process, and the purpose of knowing the person was to determine fit of the person for technology use, and physiological indicators and patterns. Although neither *getting to know* nor *knowing the person* was explicitly stated in relation to *Building a Picture* (Purc-Stephenson & Thrasher, 2010), it is reasonable to conclude the main objective in constructing the image of person and context is to represent what we know of that person; the act of constructing the image implies a process of knowing the person.

From these examples, *to know* and *knowing the person* have different connotations and serve different endpoints; however, they are deemed important to aspects of nursing practice. For Greenberg (2009), *to know* the person serves a specific purpose for assessing the caller's situation and determining the key issue, and *knowing the person* facilitates a decision-making process to address the caller's concern. For Arnaert et al. (2012), *knowing the person* appears to span *to know* the person in the immediate, as with determination of fit with technology, and a longer process to understand patterns. Common to *knowing* and *to know* the person in these conceptual models is a fundamental part of the nursing process, *assessment*, interrelated with the key concepts of *relational practice* and *communication*, which will be more fully discussed later as required competencies for telehealth practice.

Clinical Knowledge and Competencies Requisite for Telehealth Practice

Most conceptual model sources reviewed here specifically articulate and/or infer competencies required of providers in telehealth care. These competencies appear to fall into two main categories: *foundational clinical knowledge*, comprised of nursing knowledge and expertise, and *competencies requisite for telehealth practice*. Competencies are "the integrated knowledge, skills, judgment and attributes required of a registered nurse to practice safely and ethically in a designated role and setting" (Black et al., 2008, p. 173), where attributes include attitudes, values, and beliefs. Arnaert et al. (2012) identified core competencies, such as *Knowing the*

Person, Relational Practice, and *Decision Making* that align with the expected competencies articulated by CNA (2007) for RNs in telehealth practice. Black et al. (2008) distinguished core competencies as being "essential knowledge, skills and abilities" (p. 172) for practice.

Purc-Stephenson and Thrasher (2010) revealed in their meta-ethnography of nurses using telehealth that "a strong clinical knowledge base was central when making assessments via telephone" (p. 486), and new communication and assessment skills were developed or enhanced in their roles as telenurses. Arnaert et al.'s (2012) research supports this, noting RNs build on *General Skills* from nursing education and clinical experience to develop competencies for *e*-Health practice by *Adapting Practice* (e.g., *communication* and *knowing the person*) and adding *New Skills* (e.g., *technological know-how* and *marketing*). Describing *Care Delivery to People through Telephone Care,* Romero et al. (2012) found "professionals gradually unveil skills for care delivery, gaining and recognizing tools and personal and professional skills" (p. 696), which speaks to both possessing preexisting clinical competencies and acquiring new competencies for telehealth. Larson-Dahn (2000) and Looman et al. (2012) further highlighted skills and knowledge necessary for the nurse using telehealth for relationship building, assessments, integrating data sources from multiple sources, and clinical decision making. These examples suggest competencies associated with general nursing practice are a valuable precursor and foundation on which more specific competencies for telehealth may be developed. Nurses *Building a Picture* benefit from having a strong clinical knowledge base drawn from prior nursing knowledge and experience since, in the absence of visual clues, this clinical knowledge and expertise facilitates creation of a mental picture of the person (Purc-Stephenson & Thrasher, 2010; Romero et al., 2012).

Competencies Requisite for Telehealth Practice. In addition to the benefit of prior clinical knowledge and expertise, a number of additional competencies for telehealth practice were identified, including assessment, communication, and relational practice. Many of these competencies build on preexisting general nursing knowledge and skills and require adaptation for telehealth practice (Arnaert et al., 2012); however, building on or adapting these knowledge and skills requires formal preparation (Greenberg, 2009; Purc-Stephenson & Thrasher, 2010; Romero et al., 2012). Purc-Stephenson and Thrasher (2010) observed there seems to be a belief that assessment skills used in face-to-face encounters can be transferred to the telephone; however, findings indicate "specific training in telephone consultation, assessment and decision-making" (p. 492) is required to develop these skills in telehealth. It is important to note that these competencies are not separate entities but are intricately linked and integrated with each other, as will be demonstrated in the following discussion.

Assessment. Assessment is well identified in the reviewed conceptual models related to practice in telehealth, and is a well-established component of the nursing process (Potter & Frisch, 2007). Categorized as a *General Skill,* Arnaert et al. (2012) described assessment as involving physical assessment, collection of vital sign data, and assessing a patient's knowledge base. Assessment data also include descriptions of physical symptoms, an appreciation of the person's context, as well as a sense of the caller (Greenberg, 2009; Larson-Dahn, 2000; Purc-Stephenson & Thrasher, 2010). Greenberg (2009) depicted assessment as information-seeking to collect specific information that focuses on the caller's concern, and Coyle et al. (2007) saw assessment as part of the evaluation of the client's progress. Romero et al. (2012) inferred a sense of assessment that begins the process of *Construct an Image of the User's Reality,* whereby the provider gathers information to gain insight to the caller, interprets the users' signs, and imagining himself or herself in a new space with the caller to produce a "cognitive and emotional connection" (p. 698). This use of imagination and construction of space evolves through communication and relational practice strategies.

Communication. Purc-Stephenson and Thrasher (2010) described picture-building as an iterative activity that relies on skill and expertise of the nurse, depends on accuracy of information elicited from the person, and involves receipt of both verbal and nonverbal cues. Coyle et al. (2007) cited lack of nonverbal cues and inability to perform physical assessments as a challenge for nursing students entering a telephone practice experience, and

describe preparation of students through practice interviews to develop self-efficacy and confidence to engage clients over the telephone. One benefit of VC described by Looman et al. (2012) is the ability to capture images of a symptomatic individual to share with other providers to facilitate clinical decision making for symptom management.

Additional communication skills to discern cues within interactions via technological mediums are essential, and experience and mental imagery may play an important role in gaining appreciation of the person in telehealth (Purc-Stephenson & Thrasher, 2010; Romero et al., 2012). Specific skills reflected in most conceptual models for telehealth practice are the practical tasks of communication, such as listening, facilitating conversation, questioning, redirecting, verifying, and active listening (Greenberg, 2009; Purc-Stephenson & Thrasher, 2010). Romero et al. (2012) contended that creating a sense of presence, or *Becoming Present for the User*, is also important given a potential perception of distance in telehealth.

Relational practice. The importance of relationships between nurses and persons receiving care, including family members, is highlighted in many of the models, such as within Coyle et al.'s (2007) *Faculty Supervising* and, more explicitly, with Looman et al.'s (2012) *Relationship with Child & Family. Relational Practice* as a specific competency was designated as a *General Skill* in Arnaert et al.'s (2012) study, encompassing elements of interpersonal skills and emotional intelligence.

As noted, very specific skills of communication have been delineated in most conceptual models related to telehealth, emphasizing the more behavioral aspect of nursing practice. *Emotional intelligence*, identified by Arnaert et al. (2012), may be regarded as an attribute of humanistic values in telehealth, since it transcends behavioral interpersonal communication and assessment skills to enhance the nurse's self and social awareness in the nurse–person relationship, and informs the nurse's interactions and expressions of caring toward meeting a goal of health outcomes (McQueen, 2004). This is supported by Romero et al. (2012) who cited the need for "human depth, sensitivity and compassion when interactive with the user" (p. 698) and recognized the professional's high level of self-knowledge in telephone health care provision. Romero et al. also mentioned the need for cultural sensitivity and

"cultural competency" when adapting practice to the context of telephone interventions.

Decision Making in Telehealth Practice

Decision making figured prominently in most of the conceptual models, either as a focus of the provider role (Arnaert et al., 2012; Greenberg, 2009; Purc-Stephenson & Thrasher, 2010) or a collaborative endeavor with the person (Coyle et al., 2007; Larson-Dahn, 2000; Parker Oliver et al., 2009). Where provider role in the decision-making process was emphasized, consideration of caller needs, data interpretation, prioritization, and intervention planning were highlighted as key elements (Arnaert et al., 2012; Greenberg, 2009; Purc-Stephenson & Thrasher, 2010). Where the person receiving care was central to decision making, autonomy for the person and mutual agreement on health care strategies and goals were emphasized in the process (Coyle et al., 2007; Larson-Dahn, 2000; Parker Oliver et al., 2009). Collaboration between the provider and person, family, interdisciplinary team, or wider community was also referenced as important to the decision-making process (Arnaert et al., 2012; Coyle et al., 2007; Greenberg, 2009; Larson-Dahn, 2000; Looman et al., 2012).

Discussion

A synthesis of existing conceptual models and theoretical frameworks related to telehealth and nursing practice reveals processes that account for the shift in clinical practice to a setting mediated by technology and digital communication, and considerations for delivery of care to the person through this medium. Building a picture of the person through telehealth is an interactive process between provider and person, where the provider uses communication, exchange of information, and interpretations to create a more complete, or whole, essence of the person through combinations of technology, practice competencies, and therapeutic use of Self in providing care (Chinn & Kramer, 2011; Locsin, 2009). Locsin (2010) theorized integration of technology, competencies, and nursing care in nursing practice as *Technology Competency as Caring in Nursing*. This theory articulates the "harmonious relationship of technological competency and caring

in nursing" (Locsin, 2010, p. 461) as being essential for the nurse in knowing the person as whole and complete in the moment, and implies an imperative for the nurse to know the person when using technology. Thus, ability of the nurse to construct a holistic image of the person is an intentional act of care entailing more than just knowledge, skills, and ability to use technology, assess, and communicate with the person—it requires active engagement with the person, sense of presence, synthesis of multiple data sources, and creativity (Locsin, 2009, 2010; Nagel et al., 2013; Purc-Stephenson & Thrasher, 2010; Romero et al., 2012). The more abstract cognitive process of *Building a Picture* seems to equate with *knowing the person* and results in an image *to know* the person. Indeed, Locsin made a distinction between *to know* as demonstrating understanding in respect to a nurse's actions or activities, and *knowing* as the process of the nurse coming to that understanding.

For a nurse to build a picture, contextualize a person in relation to health, and achieve a degree of holistic care and presence in telehealth, he or she must be knowledgeable in nursing practice, and possess a theoretical basis, intuition, expertise, and creativity (Potter & Frisch, 2007). This underscores the necessity for nurses who deliver care using telehealth technologies to not only be well grounded in general nursing knowledge, theory, and practice competencies but to also have clinical experience, additional expertise using technology and a capacity to possess attributes of intuition and creativity to enhance provision of holistic care. Chinn and Kramer (2011) described intuitive knowing within *personal knowing* as "the immediate knowing of something without the conscious use of reason" (p. 114), and creativity within *aesthetic knowing* as enabling "the artist to express unique possibilities that fit together" (p. 134), linking both as attributes for knowledge development in nursing and making meaning in encounters with patients.

Assessment in telehealth can be regarded as being similar to traditional nursing practice, entailing a process of communication and data gathering to understand the person's health concerns, the context in which the person is situated, and engage in a holistic process of person-centered care (Potter & Frisch, 2007). The manner and extent that assessment may be executed in telehealth practice depends on type and capacity of technology used, service delivery model in which telehealth care is provided,

and the nurse's development of necessary competencies. Service delivery models affect sharing of information and coordination of resources by providers (Hebert et al., 2006), and communication skills are required to facilitate discussion and active listening with persons to collect information (Purc-Stephenson & Thrasher, 2010). Potter and Frisch (2007) described holistic assessment as an ongoing information-gathering process that attends to all dimensions of a person's health patterns utilizing interpersonal interactions and sensory perception of the nurse to arrive at mutual nurse-person goals, where the person being assessed is considered the primary source of information and interpreter of meaning.

Nonverbal physical cues in therapeutic interactions are instrumental in a nurse's understanding of the person, since often tacit dimensions of communication infer aspects of a person's physical or mental well-being, such as posturing with pain or eye contact with depression and dementia (Davidhizar & Giger, 2004). However, these forms of cues are limited or lost in telephone and RPM forms of telehealth in the absence of a visual reference. For instance, cues captured through telephone are limited to voice quality, tone, and expressions, such as laughter (Miller, 2002; Purc-Stephenson & Thrasher, 2010; Romero et al., 2012). Equally lost to the person is noncontact touch by the nurse, such as eye contact and facial expressions, both forms of nonverbal communication in nurse–patient relationships (Fredriksson, 1999).

While VC forms of telehealth offer greater opportunity for interaction and observation of physical nonverbal cues than does telephone, less nonverbal communication is observed in VC than face-to-face encounters (Hilty et al., 2002; Miller, 2002; Parker Oliver et al., 2009). VC technologies, for instance, offer a facsimile of face-to-face encounters, but the lack of sensory cues of in-person communication and perception of depth impede capturing subtleties of a glance or the intent of a sudden movement (Jerome & Zaylor, 2000). RPM and other forms of telehealth with digital text offer even less capacity for use of sensory cues between provider and person. While nonverbal cues and touch are important aspects of communication that provide a significant contribution to both sense of presence and what the nurse knows of a person (Fredriksson, 1999), these aspects are diminished or lost in use of telehealth. Additional communication

skills identified in the models such as listening, facilitating conversation, questioning, redirecting, verifying, and active listening are important for aspects of the nursing process, such as engagement and assessment. However, the role of relational inquiry to build connections, contextualize the person's situation, and provide holistic care (Doane & Varcoe, 2007; Potter & Frisch, 2007) is not well reflected in the models reviewed.

Relational practice "focuses on the experience and evolution of connection between client and nurse" (Hartrick, 1997, p. 525), and reflects an intentional act of the nurse to foster development of respect, trust, and mutuality in provision of care (Doane & Varcoe, 2007). Establishing and maintaining relationships with individuals has long been viewed as central to nursing practice, spanning the important, but more superficial, connection of a "good relationship" between nurse and person to a therapeutic alliance that results in optimal health outcomes for the person (Doane & Varcoe, 2007; Hartrick, 1997; Potter & Frisch, 2007). Hartrick (1997) made a distinction between the behavioral aspect of interpersonal practice, which focuses on discrete and concrete communication skills, such as empathy, questioning, and clarifying, and a more evolved model of human relating that reflects humanistic values, such as responsiveness, mutuality, and synchronicity. These humanistic values are manifest in nursing practice through presence, collaboration, and therapeutic use of Self, to foster holistic person-centered care (Hartrick, 1997; Potter & Frisch, 2007), and are partially reflected in existing conceptual models for telehealth.

Presence is commonly referred to in nursing literature and nursing theories as being important to nursing practice, a key element for communication and a critical aspect of holistic nursing care (Fredriksson, 1999; Nagel et al., 2013; Potter & Frisch, 2007). Presence is also important for understanding interactions between people and technology in use of computer-mediated environments, since technologies and virtual environments affect how humans organize and interpret their environment (Lee, 2004; Lombard & Ditton, 1997). Ijsselsteijn and Riva (2003) described presence as a "complex, multidimensional perception, formed through interplay of raw (multi-) sensory data and various cognitive processes" (p. 5). This is analogous to Lee's (2004) view of presence as "a psychological state in which virtual (para-authentic or artificial) objects are experienced as actual objects in either sensory or nonsensory ways" (p. 37). In both perspectives, presence is presented as a mental construct of individuals, akin to the psychological space Romero et al. (2012) describe in the context of telephone care service.

Although there is lack of consensus on the concept of decision making in nursing practice, the process is well described in the literature, and links between assessment, data gathering, interpretation, prioritization, clinical reasoning, and clinical judgement in relation to nursing process have been established (Gillespie & Paterson, 2009; Hendry & Walker, 2004; Tanner, 2006). However, the process and relationships of components of decision making are not well described or understood in the context of telehealth, particularly in relation to providing holistic care. Inclusion of persons in decision-making processes leads to better health outcomes through increased engagement, shared responsibility in goal setting, and higher levels of perceived self-efficacy and empowerment (Coyle et al., 2007; Miller, 2002; Parker Oliver et al., 2009; Potter & Frisch, 2007). Shared decision making is essential to better outcomes for individuals when more control is provided to the person, and the person is able to more fully participate with the provider in treatment and management of health issues (Miller, 2002). While the nurse has moral and ethical obligations to exercise prudent clinical reasoning and make effective decisions in clinical situations to facilitate positive nurse outcomes in care (Gillespie & Paterson, 2009; Tanner, 2006), positive health outcomes and client satisfaction are compelling reasons to foster holistic person-centered care through collaboration and mutual agreement (Coyle et al., 2007; Hendry & Walker, 2004; Miller, 2002; Potter & Frisch, 2007).

Limitations of Current Conceptual Models

While the current conceptual models provide valuable insight to key elements of nursing practice in telehealth, several limitations are evident in the preceding discussion. First, most models have a narrow focus on the type of technology they address and were not designed for application to a broader range of telehealth technologies. With the exception of Arnaert et al. (2012) and Looman et al. (2012),

models are predominantly focused on the use of telephone, and while it may be possible to adapt these models to similar technologies, it may not be appropriate or practical to apply them if the capacity of technology and ability for the nurse to engage the person is significantly different. For instance, the frameworks of Greenberg (2009) and Purc-Stephenson and Thrasher (2010) are specific to telephone and would be difficult to apply to RPM or CMC, which rely on exchange of digital text data devoid of any verbal and physical cues.

Second, none of the existing models are comprehensive in conceptualizing the range of elements in nursing practice or describing the intricate relationships that exist between the nurse, the person, and interface of telehealth technology. Arnaert et al. (2012) specifically focused on competencies required of nurses using *e*-Health technologies; this generated an understanding of knowledge and skills nurses require for *e*-Health and a conceptual model to demonstrate the levels of skills, but it was not intended to convey relationships between the competencies or to account for aspects of nursing practice and telehealth. Greenberg (2009) and Purc-Stephenson and Thrasher (2010) articulated processes of finite telephone interactions that describe important activities of the nurse and touched on, in various degrees, the depth of relationship between nurse and person. However, both these frameworks are limited to singular transactions and do not reflect other dimensions of nursing practice in telehealth, such as relational practice, presence, role of interdisciplinary collaboration, and the nature of ongoing relationships between provider and person, as may happen with chronic disease management. Most existing models also present a linear conceptualization of the association between phenomena and concepts of nursing practice in telehealth, rather than a more integrated and iterative interaction of key elements and complex processes in telehealth care. An example from this discussion that highlights the complex nature of nursing practice in telehealth are the relationships between communication, relational practice, and the interface of telehealth technology in creating a holistic approach to person-centered care.

Finally, provision of holistic and patient-centered care is an imperative of nursing practice and ethical obligation of the professional nurse (Doane & Varcoe, 2007; Potter & Frisch, 2007). In existing conceptual models of practice in telehealth, the importance of the person as focus for care is often articulated in text, but the person is not reflected as central to decision-making processes or represented in the resulting model. Only Parker Oliver et al. (2009) depicted the patient and family unit as the nucleus of a theoretical model in the use of videophone technology, whereby relationships of communication processes of the health provider team and organizational context are interwoven in a reciprocal dynamic of collaboration. As previously noted, in a holistic model of care the person is not a passive recipient of services but an actively engaged agent in all aspects of nursing care and is the central focus for outcomes.

A Proposed Conceptual Model for Telehealth Nursing Practice

The preceding discussion illustrates the complexities and challenges associated with conceptualizing clinical practice in telehealth and underscores the gap of a comprehensive conceptual model to help illuminate elements of professional nursing practice and delivery of safe, appropriate, and holistic care in the face of increasing use of a range of telehealth technologies. The existing conceptual models highlight foundational components for clinical practice in telehealth and, through comparing and contrasting these models, interrelated dimensions for nursing practice have been identified that can serve to inform holistic patient-centered care in telehealth. To that end, a *Conceptual Model for Telehealth Nursing Practice* (Figure 2) is proposed for consideration, further development, and refinement in support of future research and knowledge generation to inform evidence-based practice in this area of nursing practice.

Although full explication of this proposed model and delineating relationships of dimensions and concepts is beyond the scope of this article, the preceding review and discussion serves as a starting point for conceptualizing the emergent area of nursing practice in telehealth. The *Conceptual Model for Telehealth Nursing Practice* illustrates the relationships of key dimensions and related concepts inherent to nursing practice and delivery of care using telehealth identified in the synthesis of existing conceptual and theoretical models or frameworks specific to telehealth. The dimensions *Knowing the Person, Building a Picture, Clinical Decision Making,*
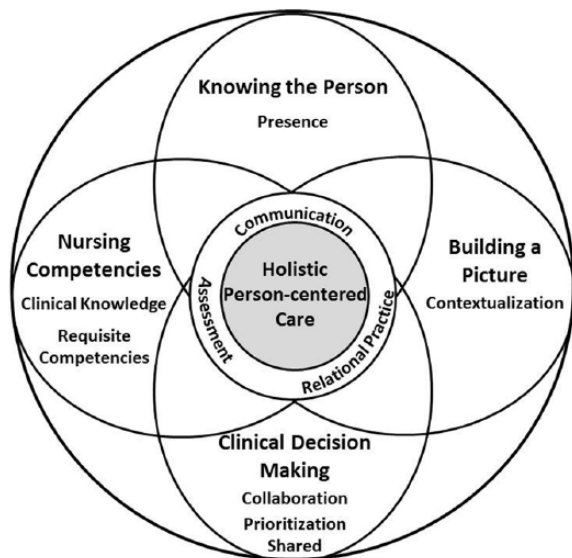
Figure 2.   Conceptual Model of Telehealth Nursing

and *Nursing Competencies* were demonstrated in the review as complex and interrelated entities that overlap with each other. Within each of these dimensions are the more specific concepts identified in the review; however, it is recognized that these also overlap and are interrelated with other dimensions and concepts.

Given the imperative and ethical obligations of the professional nurse in providing care, the nurse's interactions and activities in telehealth are focused toward *Holistic Person-centered Care* at the core of the model. The concepts of *Communication, Assessment,* and *Relational Practice* that immediately surround this core are the specific *Requisite Competencies* within the dimension of *Nursing Competencies,* and are situated here to illustrate the overlap and interrelations between these concepts and the four dimensions. The iterative and dynamic nature of telehealth nursing practice is illustrated by the overlapping spheres of the four dimensions.

As use of telehealth expands in health care delivery, technologies continue to evolve, and nursing practice shifts to virtual environments, the nursing profession finds itself faced with the dilemma of supporting practice with evidence and the generation of knowledge for delivery of care in telehealth. Given obligations of the profession to promote appropriate use of technology, be prepared in competencies for telehealth practice, and ensure safe care to clients (CNA, 2007), development of conceptual models and frameworks are necessary to guide research that will inform evidence-based

clinical practice to meet these requirements. Thus, a *Conceptual Model for Telehealth Nursing Practice* is offered to help fill this virtual gap.

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