Faculty of Philosophy and Social-Political Sciences

**THE EFFECT OF THE USE OF COMPUTER TECHNOLOGY ON NURSES'
PROFESSIONAL IDENTITY**

Abstract of the Doctoral Thesis

PhD Supervisor: Professor Daniela Cojocaru, PhD

PhD Student: Becky Tsarfati

Iași, 2023

Table of Contents

Abstract

The professional identity of nurses is perceived in the eyes of society mainly from the sociological-therapeutic aspect and less from the technological aspect. Technological developments in healthcare require nurses to include technological aspects in the definition of their professional identity. The goal of the present study was to examine the effect of the use of Electronic Medical Systems on the professional identity of nurses. The study focused on electronic registration and reporting in the day-to-day work of nurses .

The perception of the technology was tested by Technology Acceptance Model 2(TAM2) modelului de acceptare a tehnologiei 2and in relation to social influence. The research methodology included mixed methods of collecting quantitative and qualitative data to allow an in-depth explanation of the nurses' perception of their professional identity. The research tools included data collection questionnaires distributed via the Internet and in-depth interviews of nurses, selected voluntarily and randomly. The TAM2 questionnaires referred to the decision-making process on the use of computer technology, and the Professional Self-Identity Questionnaire - PSIQ, which examined the perception of nurses' professional identity. Data collected from 214 questionnaires and 10 interviews was analyzed to examine the effect of personal, professional, and social factors on professional identity and to determine significant factors influencing professional identities of nurses.

The findings showed that as nurses more clearly understood the positive impact of using technology on the quality of care, their response to change in registration and reporting method was positive and so did their professional satisfaction and professional identity. Moreover, it was found that professional and multidisciplinary teamwork had positive effects on behavior change and acceptance of EMS as a promoter of professionalism and improved professional identity. Interviews reinforced the issue of the perception of the role of the nurse as a major issue in the difficulty of nurses to make a change in the nursing practice. The nurses' ability to influence content and the EMS implementation has increased satisfaction and improved professional identity.

Ultimately, the INPI model via EMS that emerged from the study could serve as a source for policymakers and nursing educators to build professional teaching and application frameworks.

Key words: Nursing, Nurses' Professional Identity, Electronic Medical Systems – EMS, Technology Acceptance Model – TAM, Social Identity Theory – SIT

Introduction

" An identity would seem to be arrived at by the way in which the person faces and uses his experience." – James Baldwin.

Research focus

Computerized technologies affect nursing worldwide and even redefine the society's expectations of the nursing profession due to the society's growing dependence on mobile devices, social media, and the Internet (Booth, Strudwick, McBride, O'Connor, Lopez, 2021).

Each of us chooses to identify with the social stimuli that influence our behavior, as professionals we are also affected by stimuli of our professional belonging group. As for the nursing profession it forms the basis for building the professional identity of nurses, which changes and takes shape during professional life with every exposure to professional changes, personal changes, and in recent decades also technological changes (Williams & Connaughton, 2012).

Health care system has evolved and changed over the years, requiring nurses, as a part of care givers system to make role change by the influence of changing demographics, new technologies and increased health care expectations. New information technologies have been introduced into the nurse's work environment in recent years (Magnusson, Hanson & Borg, 2004; Smedley, 2005; While & Dewsbury, 2011).

Nurses today need to learn how to access to new technologies and wired information using skills to improve nursing practice (Porter-O'Grady, 2003). The overarching aim of this thesis is to examine nurse's professional identity, influenced by nurses' acceptance of information technology in their work environment.Nursing is affected by increased technological developments over the past decades, whereby the purpose of nursing care is to provide safe, efficient, and quality care. Nurses are responsible for documenting and reporting information, both qualitative and quantitative. Use of computerized technology enables access to this extensive reservoir of data within a short period of time.

A study conducted in the health services in Turkey found that while computerized technologies are used in the health system, usage is not at a desired level in nursing services because the technologies are not compatible with nursing practice needs. The study conclusions indicate

the need to improve nurses' access to computerized technology while planning the system so that it meets nurses' needs (Ay, 2016). In a review of the literature, it can be found some studies examining the impact of EMS on the work of nurses however the prevailing perception is that the introduction of computerized technology will lead to a reduction in treatment errors and improve the quality of care provided (De Leeuw, Woltjer, & Kool, 2020; While, & Dewsbury,2011). Nurses need advanced information technologies to provide safe care and to develop safe communication ways trough wired world. Nurses who have strong analytical, critical, and clinical thinking will be excellent treatment managers. As a nursing educator for more than 25 years I believe that it is nursing educator's role to develop educational programs for nursing students to integrate nursing skills and knowledge with technology to improve people and community health together with developing a stable and defined professional identity.

Research Background

The introduction of advanced computer technologies into health services necessitates a change not only in the structure of the organization, and job definitions within the organization but also in changes in the level of the individual which are reflected in the need of individuals in the organization to change day-to-day processes.

Computerized systems in the work of the nurse introduced technological challenges into nursing profession. Challenges that require adaptation to new working methods, expansion of knowledge and skills in the field of technology and integration of all this in quality care, created professional and personal frustrations. (DeLeeuw, Woltjer, & Kool,2020). Health systems as we know them are becoming more and more dependent on application of evidence-based practice trough development of information technologies. Nursing is affected by increased technological developments over the past decades, whereby the purpose of nursing is to provide safe, efficient, and quality care (Pramilaa, 2013).

Pramilaa, (2013) presents the development of computerized information technologies in the health system as a challenge whose implementation in the nursing field must be examined with respect to what is currently known as nursing informatics. Her article also explores the possibility of integrating this field into nursing studies and practice and promotes the need to identify barriers among nurses in accepting computerized technologies.

The literature examines extensively the effects of information technologies on the quality of care and the nursing decision making process in various positions. In their article, McGonigle,

Hunter, Sipes & Hebda, (2014), show that nurses' use of computerized technologies enables nurses to make updated and improved clinical treatment decisions in patient care. By using computerized technology nurses can maximize their knowledge and their ability to make patient care decisions within a short period of time. Such focused practice enables optimization of patient care.

A study conducted in two hospitals in Australia that examined the main difficulties of nurses regarding the use of Electronic Medical Systems (EMS) identified technical access barriers, lack of knowledge with technological systems and conflict in nurses' professional identity. The participants of the study indicated that EMS usage threatened their professional identity and image as they educated for independent decision making and critical thinking, (Debono, Taylor, Lipworth, Greenfeld, Travaglia, Black &Braithwaite, 2017).

 Nurses are the largest part among healthcare providers, and as such there is great importance to their ability to work with computerized technologies such as EMS (Zadvinskis, Garvey Smith, Yen ,2018). Studies on the subject have referred to nurses' use of computerized technology, but no studies have been found that have examined over time the impact of EMS on nursing practice and the professional identity of nurses.

Most of the studies that I found address research variation in nurses' information technology acceptance and multiple predictors of acceptance, including the information technology perceived usefulness and ease of use. However, the effect of Electronic Medical Systems (EMS) on nurse's professional identity has not been checked yet.

The results of the study will enable the design of a model that can formulate up-to-date approaches to the adoption and assimilation of computer technology by nurses and nursing students.

Research Aims
1. To examine the factors that are involved in nurses' decision to use new technology systems.

   1.1 To examine the factors that might promote the nurses' decision to use new technology systems

   1.2 To examine the factors that might hinder the nurses' decision to use new technology systems.

2. To identify the connection between professional identity perceived by nurses and the use of Electronic Medical Systems (EMS), (in relation to workplace, gender, professional seniority)?

Research Questions
1. What factors are involved in nurses' decision to use new technology systems?

   1.1 What factors might hinder use of Electronic Medical Systems (EMS) by nurses?

   1.2 What factors might promote use of Electronic Medical Systems (EMS) by nurses?

2. What is the connection between use of Electronic Medical Systems (EMS) and nurses' professional identity (in relation to workplace, gender, professional seniority)?

The study aims to define nurse's professional identity trough use of Electronic Medical Systems (EMS) in nurses' work. The research will rely on nurse's perception of their professional identity by examining the degree and acceptance of EMS trough Extend Technology Acceptance Model which called Technology Acceptance Model 2- TAM2, (Venkatesh, Davis, 2000), with reference to sociological and psychological behavior theories.

Technology Acceptance Model (TAM) is based on two beliefs, perceived usefulness and perceived ease of use which carry on individuals' attitude towards use of technology by behavioral intension and actual usage of EMS (Ortega, Gonzales 2011). The extend theory TAM2 is based on four beliefs that include the two technology acceptance model beliefs and two more – social influence and facilitating conditions (Venkatesh& Davis, 2000). Using the extend TAM as a theoretical underpinning in the research will contribute to understand the effect of EMS using on nurses' professional identity through those beliefs.

Significance of the Research
Nursing is a profession with a very strong social affinity and as such nursing has a social obligation to provide health services based on growing knowledge, skills, and professional skills. Nursing has the authority to educate the population health, prevent disease and holistic treatment while focusing on an ethical code. Defining the boundaries of nursing practice requires nurses to be up to date on the development and progress that is taking place in health services that enable quality treatment options.

In recent years we have witnessed tremendous development in the field of computer technology and its integration in health services. Nurses as a very significant part of health services are

committed to updating knowledge and skills in the technological field to integrate and create advanced and quality care. Academic curricula for nurses are committed to integrating content in the technology field as an integral part of nurses' training programs and at the same time health decision makers are committed to developing programs to enrich the technical skills of nurses working in hospital and community. The updated curricula and training of nurses working in hospital and in the field of computer technology will lead to a change in the nurses' perception of the nursing profession, and consequently the professional identity of the nurses.

The results of the present study will present what is the perception of nurses following the introduction of new technologies into the work of the nurse. The research will provide knowledge about how nurses understand, accept, and apply computer technology in their work. The research will lead to the presentation of the factors influencing the design of nurses' professional identity due to the introduction of computer technology and will enable the construction of a model that can create up-to-date approaches to the adoption and assimilation of computer technology among nurses and nursing students. In addition, the research data will make it possible to build further future studies to continue these trends.

Chapter I: Theoretical Framework

I.1   Theoretical Perspectives in Sociology

Sociological and social-psychological theories examine and explain the way intrapersonal relations between people affect their behavior in their social circles and the impact of social structures on organizations, groups, or individuals (Charmaz et al., 2019). Our world consists of social circles, and as individuals, we belong to several social circles that have established links between them. Social-Psychological theories place individuals in constant interaction with every social circle, and those theories acknowledge the individuals and the social world to be linked but, separated. For optimal functioning in every social circle, we strive to understand, learn, and know as much as possible about the society in which we live but, still, remain separated from it (Marcia, 1994). The Psychological Theory, conceived by Erikson (1968), advocates that identity constitutes the individuals' conscious insight of being unique while making an unconscious choice to want to belong to a group with a belief in its ideals.

In nursing, we can find the need to balance this duality between self and society as the basis for the development of professional identity. As individuals with extensive professional knowledge. nurses have conscious self-perception of themselves in the nursing profession.

However, as part of the nursing society, every nurse must act in the workplace in accordance with society norms (Godfrey, 2020).

I.1.1 Social Identity Theory (SIT)

Social psychology researched the importance of social identity to understand group behavior. This understanding can help in the comprehension and explanation of nursing group behavior. Social Identity Theory (SIT) was first presented by Tajfel (1974) as the part of self that is defined by the individual's belonging to a group. The theory describes the cognitive processes through which social identity becomes more important than one's identity as an individual. The theory also explains the influence of social identity on the individual's behavior within the group. According to the theory, the individual's goal is to maintain a positive social identity by maintaining the positive social status of the group to which he belongs in relation to the identity of relevant out-groups. His studies showed that self-categorization as group members, attributed a recognizable meaning to the individuals' behavior, and promote the shaping of a positively valued social identity.

As presented by Tajfel (1974), the social identity theory is based on three cognitive processes: social categorization, social identification, and social comparison. The first process, social categorization, is based on the understanding that individuals in a group tend to define others based on their social categories rather than the other's personal characteristics. Social identification, which is the second process allows to create the identification of the individual as a member of the group. The purpose of this process is to lead people to behavior that is based on the belief of how the members of the group should behave. The third and last process, which is social comparison, is the process in which individuals in a group compare their group to other groups in terms of status and prestige. The more the individual is convinced that his group's status is more prestigious, the higher his self-esteem will be. Thus, individuals will think and act from the perspective of their group of belonging (Haslam, 2003).

To comprehend the development of nurses' professional identity, it is important to understand the meaning that group membership has for the individuals – what it means, how it is formed, and what are the factors that affect the shaping of professional identity. The perception of social identity is important to nurses' professional identity since it can explain nurses' behavior in their work environment during the changes in nursing profession.

Nurses' professional identity can be defined as social identity because they share a common approach to work (Caza & Creary, 2016). The development of professional identity, based on

the Social Identity Theory and expressed by identification with the group of belonging, strengthens the individuals' self-esteem and pride (Skorikov & Vondracek, 2011). Research that highlights the importance and the context of social identity, can explain the impact of Electronic Medical Systems (EMS) on nurses' professional identity.

I.1.2   Role Theory

The sociologist Merton (1957) first described the Role Theory with reference to the sociological status of individuals and the behavior required from that status. Merton defined role as a set of expectations with the individuals' status in society. Roles provide a connection to other people and direction for behavior in uncertain situations. The Role Theory is a very important component in the characterization of social life and individuals' behavior patterns in society. The main assumption of the theory relates to the fact that all individuals in society are in a certain position in relation to their position, and their behavior is derived from their expectations and other people's expectations in society in relation to their status in society. Role Theory refers to the individuals' behavior as driven by the expectations of others in society and by their expectations of the role. Each role has appropriate expectations for the role played by the individuals, as well as a set of rules and norms associated with the role (Hogg, 2000).

Nurses' role performance depends on personal and professional values, needs of patients and support people, and employers' politics. Technological changes and professional development in nursing have formulated a new role definition that requires role transition (Blais & Hayes, 2016).

I.1.3   Symbolic Interactionism Theory

The guiding principle of Symbolic Interaction Theory focuses on individuals and the inter-relationships between them. According to this theory, the purpose of the membership process is to develop a cohesive and stable identity in everyone. From birth to death, individuals belong to different social circles, maintaining constant interactions with them. The process of friendship enables the interaction and creates situations of common definition of the situation between individuals in society. The process entails identical interpretations of symbols and helps in shaping a social identity and similar behavior between individuals in defined shared situations (Charmaz et.al, 2019). In the last century, there were important studies that focused on Symbolic Interactionism Theory. For example, Charles Cooley in 1902, discussed by Farberman (1985), Goffman (1969), Mead (1934), and others. Nurses develop professional identity through their work experience and by interaction between them and significant others

in the social group of nurses (Carlson, 2013). Based on my professional experience, nursing is a complex and advanced practice that combines interpersonal interaction and requires nurses to be professional. Nurses' professional identity starts being shaped from the moment the nursing studies and practice are over and social professional culturing process begins.

I.1.4 Social–Ecological Model

The theory of Bronfenbrenner (1979), related to people's development in interaction with external environmental circles that affect their life, served as a basis for the development of Socio-Ecological Theories. Bronfenbrenner (1979) examined behavior in relation to social circles through bilateral interaction. Bronfenbrenner's social-ecological model became a theoretical model in the 1980s and, to this day, it is the most common model for examining and understanding identity consolidation while referring to the social environment to which individuals belong. This theory forms the basis for an explanation of the development of nurses' professional identity during their professional lives. Furthermore, it can provide direction in relation to nurses' perception of professional identity following a change in policy and role in the health system, due to the introduction of computerized technologies as a central part of the nurses' work environment.

I.2 Theoretical Aspects of Identity

I.2.1 Definitions of identity

To understand the meaning of professional identity, we must identify first what "Identity" means. Identity is a sociological and psychological concept that answers the question "Who am I?" for an individual and "Who are we?" for a group of individuals in a profession, organization, or social group (Ashforth et al., 2008). Individuals associate themselves from the viewpoint of personal traits, social group affiliation, and work role, for the purpose of choosing a meaning for who they are and what they do in their workplace (Ashforth et al., 2008). Identity is derived from the individuals' typical behavior; from the interpersonal relationships they establish; and from the way others respond to them (Miel et al., 2002). Giddens (2009) argues that identities can be based on the ideologies people have in the different areas of life of each person, such as gender, nationality, or occupation.

I.2.2 Self-identity

Self-identity is shaped during the individuals' childhood and adolescence period and refers to steady and protrusive aspects of one's self-perception (Arnett, 2000). Individuals' self-identity is based on their self–concept and relates to self-definition, according to the definition of the social role of everyday behavior. Biddle et al. (1987) presented self-identity as tags people use

to represent themselves. Self-identity attributes a self-meaning for the individuals, since it defines their specific role and provides a mirror image for behaviors or roles that are contrary to what is accepted and defined by the individuals (Lindesmith & Strauss 1956; White & Burke 1987).

I.2.3 Social identity

Social identity is that part of the concept of "self" that is affected by the individuals' belonging to a meaningful social group. Social identity allows individuals to develop a sense of belonging and identify similarities within their group of belonging, causing them to develop positive self-esteem. This creates two concepts of in-group – "us", versus out-group - "them" when the group members try finding negative aspects of the out-group in order to enhance their self-esteem. (Tajfel, 1974; Tajfel & Turner, 1979). Social identity consolidates a group identity and a wish for belonging, leading to similar behavior of the group members.

I.2.4 Professional Identity

This section introduces the concept of professional identity as the basis for the consolidation of nurses' professional identity. Since this study explores the professional identity of nurses, a discussion of professional identity is needed. In the second half of the 20th century, scholars such as Wilensky (1964), argued that professionalization is a product of learning and experience that gives the individuals certification and credentials for working in their profession while upholding the rules of professional ethics. Abbott (1981) suggests criteria to segregate profession from occupation. By the end of 20th century, researchers such as Benveniste (1987) and Ibarra (1999) changed the perception of professionalism and suggest that professionalism was based on skills or education.
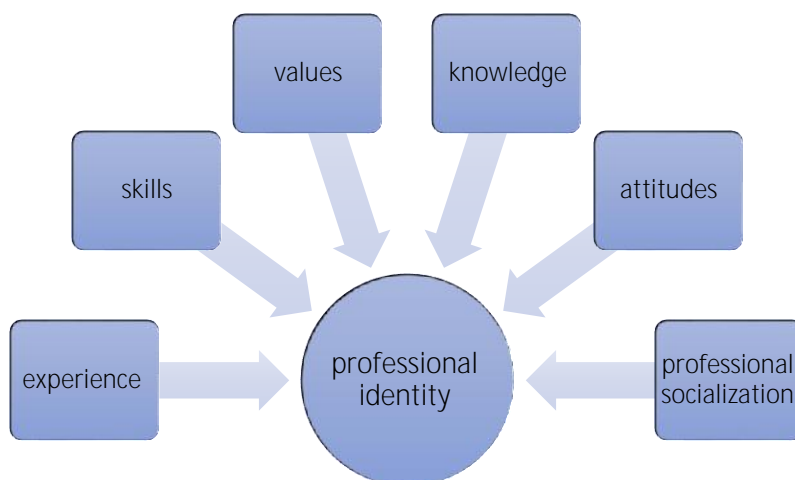
Figure No. I.1: Professional Identity Components

Figure No. I.1 includes all the professional identity components defined above. The importance of professional identity resides in the fact that it is the reason for individuals' behavior, self-perception, and work attitude and, hence, the importance of this study. Through the development of professional identity, individuals find their purpose in society, as well as their contribution to society which affects their self-perception (Siebert & Siebert, 2005). Increasing the importance of defining professionalism has brought professional identity to new heights where highly important professions - "valued professions" - defined in this way by society, have become coveted by the individuals. Those professions enable individuals to gain a positive professional identity (Dutton et al., 2010). This study examines nurses' professional identity as perceived by them, using data about the nurses' acceptance of implementing new technologies in their work environment, analyzed by the Extended Technology Acceptance Model based on social behavioral research.

I.3   Nursing and Nurses' Professional Identity
I.3.1   Introduction
The meaning of being a nurse implies not only professional techniques but also a socialization process that allows for internalization and the development of a professional identity. Professionalism in nursing is a fundamental and essential concept that stems from interaction and interpersonal relationships in the workplace (Shahim et al., 2011).

I.3.2   Nursing as a profession
For a very long time it has been debated whether nursing is a profession. To understand the reason for this, one must first present what is a profession and what leads to the definition of profession in relation to a particular profession. Studies have shown that to be considered as a profession, this field of practice must have a unique training program, unique practice traits learned by individuals with specific training for the same occupation (Blais & Hayes, 2011; Ritchie & Gilmore, 2013; American Nurses Association [ANA], 2008).

In Israel, the Nursing Administration, which is responsible for the training programs, sets the professional standards for all students while they are learning. After graduation and passing the government test, the Nursing Administration defines for all those involved in nursing the professional standards for functioning in the various fields of nursing. Socialization processes in nursing include key issues: (a) belonging - a sense of belonging to the profession and the professional group; (b) approval - approval of the significant others for professional competence; and (c) knowledge - knowledge from many and diverse healthcare areas that allow

responsible and professional functioning with optimal quality (Shahim et al., 2011). Developing professional identity is defined as professional socialization.

Nurses' professional identity is shaped and consolidated when they internalize and reflect the core values of the profession, engage in personal development and professional development, acquiring experience and growing professionally (e.g., Adams et al., 2006; Apesoa-Verano, 2007; Chan & Schwind, 2006; Pullen, 2021).

I.4 Nursing and Sociology

Sociology is a study of human behavior in the social context (Faris, 2021; Giddens et al., 2021). Great importance is attributed to the field of sociology in healthcare professions since social situations and social conditions are often a source of health problems. Sociology can help in understanding the relationship between social environment and the generation changes in health conditions. Sociology serves nurses as a tool for better understanding individuals' behavior during illness, or the right way of changing behaviors in order to prevent illness. The disciplinary aspect of sociology, aiming to achieve individual cooperation, is to understand this by looking from a "society" or "community" perspective (McPherson, 2008).

I.4.1 Sociology in nursing

Nursing is a social process that involves interactions between individuals, such as healthcare givers, nurses, and patients. This interaction takes place in structured social frameworks and is affected by factors that are external and internal of these frameworks. The social frameworks outline the way nursing professionals are trained, and the nurses' commitment to the nursing profession. Furthermore, they shape the way nurses are cared for according to the needs of individuals, when they present society's expectations from the nursing profession, (Allan et al., 2016).

I.5 Electronic Medical Systems & Technology Acceptance Model
I.5.1 Digital Technologies and Electronic Medical Systems in Health (EMS)

Digital technologies are electronic and internet sources of information that aim to streamline and access medical and nursing healthcare information for the use of health consumers and healthcare system staff. Digital health includes categories such as mobile health (mHealth), health information technology (IT), telehealth, and telemedicine. Digital health technologies have a wide range of uses, and apply computing platforms, software, and sensors for healthcare and related uses (Booth et al., 2021; McBride et al., 2021). The main purpose of digital technology tools is to give health caregivers a holistic view of patients' health through access to data, as well as to give patients more control over their health. These technologies can

empower health caregivers of health, helping them in making better-informed decisions about their patients' health, and offering new options for prevention, diagnosis, and management of chronic conditions (Booth et al. 2021).

Among the range of digital technology options available in this study, Electronic Medical Systems (EMS) is the technology used for examining its effect on nurses' professional identity. The choice of this technology stemmed from familiarity with nursing practice and understanding of the centrality and importance of nurses' registration and reports in their day-to-day work. By using computerized technology, nurses can maximize their knowledge and their ability to make patients' care decisions within a short period of time. Such focused practice enables optimization of patients' care. Kutney-Lee et al. (2019) showed that the widespread adoption of EMS use in the workplace, led to a higher quality of work perceived by nurses.

I.6 Technology-Adoption Predicting Models
I.6.1 Technology Acceptance Model (TAM)
TAM is a model that predicts individuals' response to change and is very common for prediction in health systems. The model focuses on end-users' intention to use technology. Nurses are the end-users in the context of the healthcare system and, thus, this model will be used for examining the factors that affect nurses' intention to use computer technology. The Technology Acceptance Model (TAM) has been used in research to understand the acceptance of new electronic technologies. The theory was conceived by Davis (1985, 1989), and the model is grounded in the Theory of Reasoned Action (TRA) of Fishbein and Ajzen (1975). This is a socio-psychological theory for explaining behavior-affecting factors. According to TRA, subjective norm and individuals' attitude should affect behavioral intention (Fishbein & Ajzen, 1975). Self-identity plays an important role in predicting individuals' behavior in the structure of TRA theory (Spark, 2000).

Table No. I.1: TAM variables definition (Holden & Karsh, 2010)

Perceived Usefulness (PU)	The expectation that uses of technology will improve job performance
Perceived Ease of Use (PEU)	The expectation that the technology will be easy and friendly to use

Attitude Toward Using (A)	PU & PEU will lead to use new technology assessment judgment of the target behavior by individuals
Behavioral Intention (BI) - Acceptance	The motivation or willingness to exert effort in order to perform the target behavior
Use	A specific behavior of interest performed regarding information technology system.

I.6.2 Technology Acceptance Model 2 (TAM2)

Various studies (e.g., Sanchez-Franco & Roldan, 2005; Szajna, 1996; Taylor & Todd, 1995) have validated TAM to show the benefit of the model in different work environments. Nevertheless, limitation have been found, and to overcome the limitations, Venkatesh and Davis (2000) extended the original model so it can cope with technological innovations, calling it TAM2. The model incorporates into the basic TAM model two more groups of factors that affect the adoption or rejection of the use of computer technology. The first group is entitled social impact and comprises the components of subjective norm, experience, voluntariness, and image. The second group, referred to as cognitive instrumental impact, includes the components of job relevance, output quality, and result demonstrability. People decide to behave in a certain way, based on the understanding that instrumental behaviors are related to goals at a higher level than simplistic demonstration of behavior (Venkatesh & Davis 2000).

I.7 Technology Acceptance Models in Health Systems

The purpose of using models of technology acceptance within the healthcare system and healthcare service providers is to predict the healthcare teams' responsiveness to and adoption of new technologies. Holden & Karsh (2010) presented a review in which they stated that TAM in all its versions had been found as the most suitable model for predicting the adoption of information technologies by healthcare providers. Sixteen studies conducted by these researchers illustrated a positive relationship between perceived usefulness and intention to use. A strong positive relationship was also found between the attitude-behavioral intention and behavioral intention-use. Furthermore, findings showed a weak relation between perceived ease of use on attitude and perceived ease of use on behavioral intention. The researchers suggested that these findings were due to the participants' lack of experience in using the

technology. To summarize the studies of this topic, it is noteworthy that TAM has been found to be most suitable for health systems.

I.8   Conceptual Framework

Figure No. 1.2 depicts the conceptual framework of this study. Sociological theories like SIT and Role Theory explain nurses' behavior following the technological changes in the healthcare system. Social identity and professional identity share a similar behavioral component that allows individuals to adopt behavior according to significant others in the professional society. The use of TAM2 model will facilitate the determination of the factors that affect the adoption of new technology by nurses. Moreover, it will help in examining to what extent social processes and cognitive instrumental processes affect the correlation between the use of new technology and professional identity. Social identity and professional identity share a similar behavioral component that explains people's decision to adopt behavior in accordance with significant others in professional society The use of the TAM2 model makes it possible to identify the factors influencing the adoption of new technology by nurses, and it helps to examine the degree of influence of the social processes and the cognitive instrumental processes in the use of new technology.
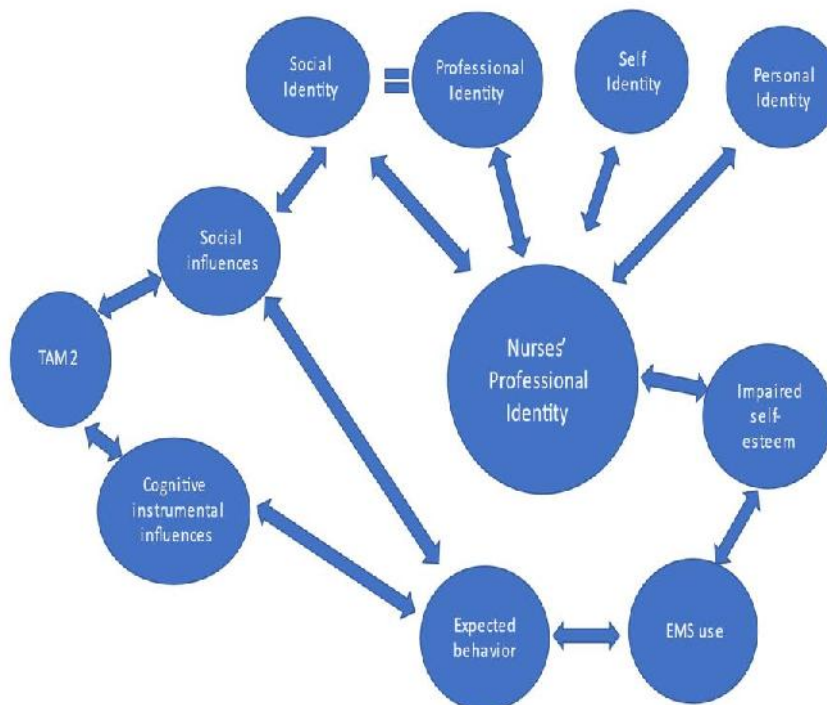
Figure No. I.2 – Conceptual Framework

Chapter II: Research Approach and Methodology

II.1 Research Hypotheses

1. Cognitive instrumental processes and social influence processes will be related with perceived usefulness of the use of computerized technologies.

2. Nurses in community centers will show higher acceptance of computerized technologies than nurses in hospitals.

3. Hospital nurses in departments that require special professionalization will show higher acceptance of computerized technologies than nurses in regular departments.

4. Gender will not be found as a central factor for acceptance of computerized technologies.

5. Younger and less experienced nurses will show higher acceptance of computerized technologies than older and more experienced nurses.

6. Nurses with higher acceptance of computerized technologies will have higher perception of professional identity.

II.2 Research Variables

Dependent Variables

- Use of Electronic Medical Systems (EMS)
- Nurses' professional identity
- Nurses' acceptance of computerized technologies

Independent Variables

- Age
- Gender
- Years of seniority
- Workplace – hospital, community care centers, intensive care units, general departments.

II.3   Research Paradigm

This study interrelates between interpretive and pragmatic approach and is conducted according to both quantitative and qualitative methods, each method complementing the other. To display the nurses' technology acceptance and its effect on their professional identity in my thesis I will adopt interpretivist and pragmatic paradigms together. The interpretivist paradigm (Pham, 2008) will offer me an understanding how nurses feel about changes made from new technologies in their work environment and what are their acting decisions about this issue.

Pragmatic paradigm according to Creswell (2014) is a way of researchers to use mixed approaches to understand the problem instead of being committed to one way of thinking. As the pragmatist that sees the world in many ways the researcher is free to use the techniques of collect and analyzing data. The way of collecting quantitative and qualitative data provides the researcher freedom of options to understand the problem and not to find or suggest the solutions.

II.4 Research Approach

This study aims to demonstrate the factors that impact nurses' professional identity when using EMS. However, it is also important to understand the reasons that lead nurses and build their professional identity. The mixed methods paradigm, namely the integration of two approaches, allows a comprehensive presentation of the effect of Electronic Medical Systems on nurses' professional identity.

II.5 Research Methodology

Table No. II.1 – Research Design

Stage/ Study	Aim	Research Question	Research Instruments	Research Population	Data Analysis
1 Quantitative research	To examine the factors involved in nurses' decision to use new technology systems through Technology Acceptance Model (TAM 2)	1	Close-ended Questionnaires-TAM2 questionnaire	Registered nurses working in hospitals in general, or intensive care units; and registered nurses working in community centers – 214 participants	Statistics

	To identify the connection between professional identity perceived by nurses and the use of Electronic Medical Systems (EMS)	2	Professional Identity Questionnaire for the Health-Care Professions		Statistics
2 Qualitative research	To examine the factors involved in nurses' decision to use new technology systems through Technology Acceptance Model (TAM 2)	2	Semi-structured interviews	10 interviews of registered nurses in community centers and hospital departments	Content analysis
3	To create a model that explains the factors affecting nurses' professional identity				

Chapter III: Findings

III.1 Findings Obtained from Research Question No. 1: "What Factors Are Involved in Nurses' Decision to Use New Technology Systems?"

The research question comes to examine the factors that influence the use of EMS among nurses and includes within it the examination of the cognitive instrumental factors and the

social factors that influence the acceptance of EMS by the nurses through the TAM2 questionnaires. In addition, the question includes in it the examination of the factors that promote or hinder, according to the nurses' perception, the use of EMS and was examined by semi-structured interviews. As appears in research question 1.1 and research question 1.2 for which the findings will be presented later in the chapter.

To investigate research question No. 1, I first examined the data according to the TAM2 model, that focused on the relationships between cognitive instrumental processes, social impact processes, and perceived usefulness of the use of technology. This question was examined in the aspect of the nurses' perception of the use of EMS according to the TAM2 questionnaires which aim to test the degree of influence that cognitive instrumental processes and social processes have in relation to the use of EMS, as raised in hypothesis number 1- Cognitive instrumental processes and social influence processes will be related with perceived usefulness of the use of computerized technologies. The examination was by a multiple hierarchical regression of the perceived usefulness of the use of technology, with the domains of cognitive instrumental processes and social impact processes. Other factors that have been examined were years of seniority and gender.

The regression model was calculated while controlling for seniority in nursing and gender, found in Tables Nos. III.1(Appendix 5) and III.2 (Appendix 6) as related to the main variables of this study. They were introduced in step 1 of the regression model, and the domains of cognitive instrumental and social impact processes were introduced in step 2, as shown in Table No. III.1. (Appendix 5) The regression model was found significant, with 47% of the variance in the perceived usefulness of the use of technology being explained in it.

The domains of cognitive instrumental processes and social impact processes added 34% to the explained variance in perceived usefulness, beyond seniority in nursing and gender. It is noteworthy that all significant relationships represented cognitive instrumental processes, while social impact processes were unrelated to perceived usefulness.

The finding obtained from the data showed that cognitive instrumental processes were related to higher perceived usefulness of the use of technology. Significant and positive relationships were found between seniority in nursing, perceived ease of use, job relevance and output quality, and perceived usefulness. Thus, the higher seniority in nursing, the greater perceived ease of use, the greater perceived job relevance, and the higher output quality, were related to higher perceived usefulness of the use of technology. This finding was also supported by the

interview data which indicated that the acceptance of technology contributed to nursing practice as shown in theme 3 -Table No. III.2(Appendix 6). The nurses acknowledged that the use of computer technology was an essential advantage and was considered as a positive component in the improvement of nursing practice

III.2 Findings Obtained from Research Question No. 1.1: " What factors might hinder use of Electronic Medical Systems (EMS) by nurses?"

Findings associated with the factors that might hinder use of EMS were obtained prominently from the participants' interview data and were classified under theme 2: Difficulties in applying computer technology and were presented in Table No. III.3 (Appendix 7). The findings show that when the nurses experienced a situation where there was a lack of knowledge about the correct way to use electronic registration, they encountered difficulties in applying the new technology, nurses encountered difficulties in applying the technology when they had to adjust to a new registration and reporting method. To sum up, the difficulties caused by the application of the technology, evoked a sense of frustration because of the nurses' attempts to use the technology for registration and documentation, instead of providing nursing care to their patients.

III.3 Findings Obtained from Research Question No. 1.2: "What factors might promote use of Electronic Medical Systems (EMS) by nurses?"

Findings associated with the factors that might promote use of EMS were obtained prominently from the participants' interview data, classified under theme 3: Positive aspects of the application of computer technology as presented in Table No. III.4 (Appendix 8). Additional findings that presented factors with an effect on the nurses' positive perceptions of computer technology, were explained in this table. This question was also examined at the level of the degree of acceptance of the technology by the nurses and it was found that acceptance of technology was rather high among the nurses, ranging between 4.45 and 5.98, for the various items (SDs = 1.19 to 1.77, score range 1-7). Table No. III.4 (Appendix 8) presented the distribution of the items (n = 198 to 214). Results showed that the highest mean scores were found for 'job relevance', ranging between M = 5.86 and M = 5.98. Next were the mean scores for 'result demonstrability', ranging between M = 5.61 and M = 5.76; 'perceived usefulness', ranging between M = 5.32 and M = 5.64; 'output quality', ranging between M = 5.25 and M = 5.54; 'perceived ease of use', ranging between M = 4.92 and M = 5.56; and 'subjective norm', ranging between M = 5.15 and M = 5.21. The lowest mean scores were found for 'image', ranging between M = 4.45 and M = 4.74. Hence, about 60% to 65% of the nurses concurred

that the use of technology was relevant and important to their work. Quite similarly, about 50% of the nurses agreed that they received a high-quality output from the system, 'Subjective norm' was somewhat lower, with about 42% of the nurses, on average, agreeing that important others supported the use of technology, and about 54% expressing a neutral opinion. Finally, only about 32% of the nurses thought that using the system was related to a high status or a positive image.

Qualitative findings that supported the quantitative findings associated with factors that might promote use of Electronic Medical Systems (EMS) by nurses, were obtained from the participants' interviews data, classified under theme 3: Positive aspects of the application of computer technology, as presented in Table No. III.2(Appendix 6). The nurses attested that quick access to extensive information resulted in efficient treatment, enabled high-quality treatment while relying on receiving data in a short period of time. To sum up, the positive aspects of the computer technology application resulted from the collaboration between nursing staff and computer unit. Finally, the computer technology application was perceived as positive because it could prevent mistakes in registration and reporting.

III.4 Findings Obtained from Research Question No. 2: "What is the Connection between Use of Electronic Medical Systems (EMS) and Nurses' Professional Identity (in Relation to Workplace, Age, Gender, Professional Seniority)?"

One of the factors explored was the nurses' workplace. This study focused on the relationships between place of work (hospitals vs. community centers), and the acceptance of technology, examined by a series of independent t-tests, as shown in Table No. III.5 (Appendix 9). Results show that most differences are non-significant. An exception is the score for 'result demonstrability', which is found higher among hospital than community nurses.

The second factor in this research question focused on the relationships between type of hospital department (requiring professional studies vs. general) and the acceptance of technology. It was examined by a series of independent t-tests, as shown in Table No. III.6 (Appendix 10). Results showed that the difference for professional identity was significant, with nurses in departments that require professional studies reporting a more advanced professional identity than nurses in general departments. All differences concerning the acceptance of technology were non-significant.

The third factor that was examined focused on the relationships between age and years of seniority in nursing and the acceptance of technology. This was examined by Pearson

correlations, as shown in Table No. III.7(Appendix 11). It is noteworthy that age and years of seniority in nursing were highly correlated: r = .89 (p < .001). Results showed positive and significant correlations between age and years of seniority in nursing and the acceptance of technology and professional identity. Most notable correlations involved professional identity, cognitive instrumental processes, perceived usefulness, job relevance, and output quality. That is, older and more experienced nurses reported a more advanced professional identity, and greater cognitive instrumental processes concerning the use of technology (involving mainly perceived usefulness, job relevance, and output quality). Interestingly, age and seniority in nursing were unrelated to social impact processes concerning the use of technology (i.e., subjective norm and image).

The last factor that was examined, focused on the relationships between gender and the acceptance of technology. This was examined by a series of independent t-tests, as shown in Table No. III.8 (Appendix 12). Caution should be exercised when interpreting these results due to the small number of male nurses in the sample (n = 25, 11.7%). Results showed that most differences were non-significant. Exceptions were the total score for cognitive instrumental processes, and its dimension 'result demonstrability', which were found higher among female than male nurses.

To summarize the analysis of the research data, two relevant areas were examined: the first one was nurses' perception of their professional identity, and the second one was nurses' professional identity perception in relation to computer technology -Tables Nos III.9 and III.10(Appendix 13, Appendix 14). The findings illustrated in Table No. III.9 (Appendix 13) showed that professional identity perception was rather high among the nurses, ranging between 2.44 and 6, with a mean of 5.13 (SD = 0.74, median = 5.31). Table No. III.9 (Appendix 13) presented the distribution of the items (n = 202 to 208). Results indicated that most nurses rated themselves as 'qualified' or 'highly qualified' on all items.

Table No. III.10 (Appendix 14) presented the distribution of the research variables and their intercorrelations for acceptance of technology and professional identity. It included both the acceptance of technology and the total scores of 'cognitive instrumental processes' and 'social impact processes. As mentioned above, the results illustrated that means for professional identity and acceptance of technology are rather high. Professional identity was positively and significantly related to acceptance of technology (except for 'image'). Hence, the greater acceptance of technology was related to one's perception of a more advanced professional self-

identity. The various aspects of acceptance of technology were moderately-to-highly interrelated (except for 'image'), so that a higher acceptance of some domains was related to a higher acceptance of the others: 'perceived usefulness', 'perceived ease of use', 'job relevance', 'output quality', 'result demonstrability', and 'subjective norm'. The total score for 'Cognitive instrumental processes' was significantly related to the total score for 'social impact processes' (r = .39, p < .001).

Table No. III.11 (Appendix 15) presented the impact of using technology on nurses' professional identity (theme 1). 50% of the interviewees presented the use of computer technology as a professional advancement that increased the sense of high-quality and safe work, progress represented the nurses' feeling sense that they had become an integral part of the whole range of health-care professions that used computerized technologies. The transition to electronic registration instead of manual registration was seen as a source of professional pride which was connected to the previous category of progress, i.e., a positive attitude towards nurses' professional identity. To sum up, despite the nurses' perception of using technology as progress, professional pride, and a sense of advancement, it was also perceived as a dissonance.

The quantitative findings in the study showed that the nurses' professional identity perception was at a high level. This was prevalent among most of the nurses who defined themselves as having high-level professional skills. As for the use of computer technology, nurses with extensive professional experience had a cohesive and good professional identity perception despite the need for behavioral change in nursing practice.

These findings were also supported by the findings of the qualitative method, demonstrating that nurses felt empowered and advanced at a professional level due to the introduction of computerized technology. They noted that the technological change had brought them closer to being an integral part of the healthcare system and they felt pride and progress at the level of professional perception. The mixed method approach, implemented in this study, facilitated presentation of the reasons why nurses accepted positively or negatively the computerized method of recording and reporting in the nursing practice.

Chapter IV: Conclusions & Recommendations
IV.1   Factual Conclusions
IV.1.1 Factual conclusions obtained from research question No. 1
Research question No. 1: "What Factors Are Involved in Nurses' Decision to Use New Technology Systems?"

Nurses' decision to use new technology systems was related to their perception that adopting new behaviors functions were relevant to their job, could improve their performance and advance the quality of care. Furthermore, nurses' decision to use new technology systems was related to their individual abilities to handle the new technology, to their work and to their positive inclination to use technology as an improvement of their professional identity.

IV.1.2 Factual conclusions obtained from research question No. 1.1
"What factors might hinder nurses' use of Electronic Medical Systems (EMS)?"

Nurses' response to the use of computer technology depended on the extent of their knowledge of using the system and the degree of support they received from the computer unit staff. Knowledge and experience were components that affected the consolidation of the nurses' professional identity. Improving the level of technological knowledge and increasing the experience in the use of computer technology by accompanying work teams such as a computer unit, were key factors in shaping the professional identity of nurses. The transition to the use of EMS evoked the nurses' sense of ambiguity in relation to their role. The gap between what they were taught as part of their studies and what they were required to do in their work, creates a sense of incompatibility and emotional dissonance in relation to their role. Nurses' tendency to avoid using technology was associated with the introduction of a change in nursing practice without prior preparation, making them feel they were wasting their time and coping with a heavy workload.

Nurses' decision not to use new technology systems was related to professional dissonance. This was due to lack of technical knowledge and to the clash with the image of nursing as a caring profession rather than a technical one and was associated with lack of technological assistance when the technology failed.

IV.1.3 Factual conclusions obtained from research question No. 1.2
"What factors might promote nurses' use of Electronic Medical Systems (EMS)?"

Promoting the nurses' use of Electronic Medical Systems (EMS) was associated with the collaboration with the computer technology team within the organization. Moreover, it was related to the understanding that the effectiveness of EMS in improving the quality of care and preventing errors in patients' care would serve nurses as a key tool in registration and reporting, despite the reported difficulty in using EMS.

IV.1.4 Factual conclusions obtained from research question No. 2

"What is the relationship between the use of Electronic Medical Systems (EMS) and nurses' professional identity (in relation to age, professional seniority, gender, workplace)?"

Nurses' professional identity consolidation was related to a sense of greater professional satisfaction and perception of professional identity on a positive level when using EMS. Professional identity shaping was associated with older nurses' positive attitude towards the use of EMS due to their professional experience. These nurses realized that the quality of care could be improved, although it took them longer to adjust to the use of EMS. Gender as a factor that affected the use of EMS, had no research significance in the decision-making process regarding technological change in nursing practice. Nurses' professional identity consolidation (in relation to age, professional seniority, gender, workplace) was associated with their belief that EMS enabled them to provide optimal care to their patients.

IV.2 Conceptual Conclusions: Improving Nurses' Professional Identity by Adopting EMS

The findings of this study enabled the design of an evidence-based model for understanding how nurses' professional identity evolved through the introduction of EMS into their practice.

Figure V.1 presents the INPI via EMS model. The figure illustrates two main groups of factors that affected the nurses' perception of technological changes in nursing practice as an integral part of the definition of their role. The nursing staff' lack of knowledge of computer use, the introduction of technology without the need for initial mentoring and assistance, and the feeling of emotional dissonance were found as factors that inhibited the behavioral change in nurses' role. Furthermore, the model showed that when a working relationship was established with the technology team, and the nurses were given the option to modify the software according to their professional needs, the nurses believed that using EMS improved the quality of care. This resulted in a re-perception of defining the nurses' role. Computer technology was considered as an essential part of improving the quality of care and an integral part of the nurses' role.

Moreover, the INPI via EMS model illustrated that when the perception of technology was positive and accepted by the nurses as contributing to the nursing practice, an improvement in professional satisfaction was demonstrated, synergistically leading to an improvement in the professional identity. From a sociological aspect, the model manifested the importance of teamwork as reflected in the collaboration between nurses and computer support team.

Mentoring and support of the computer unit staff increased the nurses' knowledge and experience of computer technology. Hence, this model could be considered as an integrative model that connected the areas of healthcare, nursing, and technology.
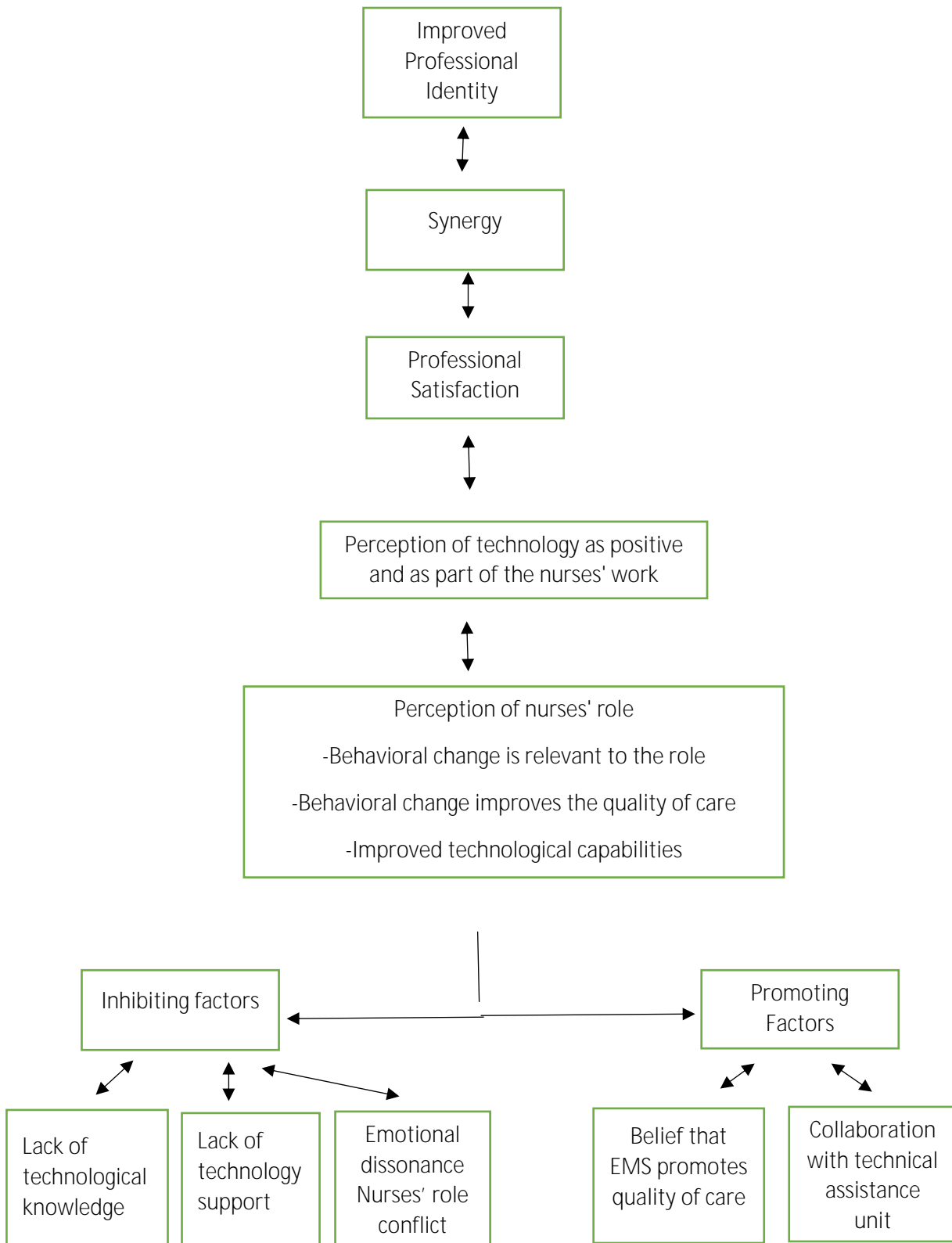
Figure No. IV.1: Improving nurses' professional identity by adopting EMS: INPI via EMS Model

Nursing is a therapeutic profession and, therefore, another important sociological aspect demonstrated in this study was the nurses' perception of themselves as part of a professional group of belonging that defined the practice, values, and norms of behavior in their work. Professional behavior and professional development depended on technological and social changes and the demands of society from the nurses' role. Consequently, this model could also be seen as a developmental and humanistic model that addressed nurses as individuals in a society that was affected by progress and social changes and not just professional ones.

IV.3 Practical Implications and Recommendations

The INIPI via EMS model that emerged from this study can be useful for policy makers, nursing teaching staffs, as well as nursing educators for consolidating nurses' professional identity within the context of introducing technology into the profession.

IV.3.1 Recommendations to health administration – nursing administration

1. For the INPI via EMS model to be implemented, it is recommended that nursing administration should consider creating Nursing Administration committees that will include nurses from the various professional levels, to set policy and chart a path for the proper introduction of computer technology in healthcare institutions.

2. It is recommended setting up ongoing professional development frameworks for nurses to enhance their technological skills and abilities.

3. It is recommended setting up joint teams of nursing and technology for maintaining a failure-free adoption of EMS.

IV.3.2 Recommendations to healthcare institutions

1. It is recommended to developing training and enrichment programs for nurses, in collaboration with the computer unit, before the introduction of computer technology.

2. It is recommended involving nurses in new EMS in caregiving units, allowing quick and easy acceptance of computer technology.

3. Healthcare institutions should appoint computer trustees to accompany nurses throughout the period of the technological change introduction.

IV.3.3 Recommendations to nurse educators

Nursing informatics and the use of information technologies in nursing work are an essential part of defining the role of modern nurses. Nursing educators today are facing the challenge of

preparing nursing students for increased use of information and technological skills as an integral part of nursing education.

1. It is recommended revising the curriculum in nurse education, adding specific courses in the framework of early training, aiming create an early acquaintance with EMS.

2. It is recommended planning enrichment programs for nurse educators.

3. It is recommended designing teaching programs to expand knowledge about EMS.

IV.4   Research Limitations

This study focused on the level of nurses in the field and their perception of their professional role. Nevertheless, to be able to apply the understandings obtained from this study, one should also examine the level of decision-makers and managers.

The interviews in this study were conducted with nurses who volunteered for it. Thus, there was an option that this type of voluntary sampling created a situation where those who did not volunteer to be interviewed could present a different perspective on the research topic. Another research limitation was the fact that the impact of technology on professional identity had not been studied in Israel, and the findings could not be compared to previous studies.

Finally, it can be argued that the rapid development of information technology in the field of healthcare, could lead to a situation whereby findings from studies would be less relevant. At the same time, the research findings constituted the basis for future research and a good perspective for understanding and building nurses' professional identity.

IV.5   Contribution of the Study

The INPI via EMS model that was developed in this study, bridged the gap in knowledge in nurses' professional identity (Adams et al., 2006), TAM (Davis 1985), EMS (Kruse et al., 2018). Moreover, the model was based on data collected for this study and, therefore, it is original and presented as an innovation obtained from this study. The INPI via EMS model made a considerable contribution to knowledge and had the potential to change nursing training policy in Israel.

Another important contribution of this study is in the aspect of sociology. The field of nursing most often relies on quantitative research methods in this study. By using the mixed methods paradigm, I was able to provide information not only on behavioral trends but also on causal explanations about nurses' behavior. This contribution enabled the understanding of behavioral

processes and decision-making in the sociological aspect. The study provides information not only on behavioral trends but also on causal explanations of nurses' behavior. The study emphasizes the existing relationship between the nursing profession and society, the sociological concept that nurses behave in accordance with the norms of the professional group to which they belong is not much expressed in the context of computerized systems. At the same time, the study found a close connection between the nurses' sense of professional responsibility to provide quality care and the improvement of their professional identity.

The focus of the study presents the fact that nurses are committed to society, in contrast to the common notion that nurses are committed to a professional affiliation group.

The findings of this study could contribute to several areas in nursing. For example, nurses, healthcare institutions and nursing leaders, nursing educators and academicians, and practical knowledge. These are discussed below.

IV.5.1 Contribution to nurses and nursing

This study highlighted the fact that nurses had adjustment difficulties due to the introduction of new technology in their work. This difficulty could be resolved by expanding knowledge and skills in the field. Consequently, focusing on these two areas could be beneficial for introducing technology to ongoing work in a faster and better way. This study also raised awareness of the fact that technological advancement brings with it an improvement in the quality of care and in professional identity.

IV.5.2 Contribution to healthcare institutions and nurse leaders

This study raised awareness of the nurses' sense of frustration due to the introduction of computerized work methods without consulting them and without mapping their needs, as well as to the lack of professionals to accompany the nursing staff. These findings should make healthcare managers aware of the need to build a suitable framework for implementing computer technology, combined with the need to open inter-team communication channels.

IV.5.3 Contribution to nursing educators and academicians

This study facilitated the comprehension of the mode and delivery of training in computers and information technology skills for nurses in the workplace because it presented through the INPI via EMS model the factors that affected nurses' decision to use computer technology. While identifying the relevant factors, learning frameworks could be set up in compliance with the needs of nursing students during their training, to expand the knowledge and skills of using

computer technology in clinical experience. This would improve the skills of using computer technology after graduation.

Social changes such as technological progress, bring about the need to change the perception of nurses' role in the sociological aspect. The discipline of sociology in the healthcare professions in general, and nursing played a part in bringing about the construction of new work frameworks that matched the expectations of the population.

IV.5.4 Contribution to practical knowledge

1. The INPI via EMS model contributed to the nursing training policy because the model facilitated the identification of factors and the design of programs tailored to the needs of the nursing staffs.

2. The INPI via EMS model allowed focal identification of needs both in the field of knowledge and in the field of technology.

IV.6 Future Research

This study expanded the field of research of computer technology in the practice of nursing and nursing education. Recommendations for future research are based on the insights of this study.

1. It is recommended replicating the study with a larger sample of nurses for the purpose of obtaining more extensive findings.

2. Since computer technology is a highly dynamic field, it is greatly recommended conducting similar research with a focus on new technologies.

3. This study presented data on the adjustment difficulties of nurses mainly with high professional experience. Consequently, a future study of nurses with long experience is recommended to find out whether there is a change in this trend following systemic changes introduced.

IV.7 Universal Significance of This Study

Nursing is a social care profession that affects and is affected by society. As such, nurses have a direct connection not only in providing care but also in promoting the health of the population. The introduction of computer technologies for improving the quality of care was the goal of healthcare decision-makers in many countries around the world. One of the characteristics of

these technologies was the fact that they were easier to use in developed countries due to the allocation of economic resources.

Developing countries that have limited resources for implementing advanced computer technology can use the INPI VIA EMS model to target them with components that can identify learning needs and strengths. Moreover, the model can be used during the introduction of computer technology in an orderly manner with the full cooperation of healthcare professionals and all relevant staff.

References

Abbott, A. (1981). Status and status strain in the professions. *American Journal of Sociology, 86*(4), 819-835. https://doi.org/10.1086/227318.

Adams, K., Hean, S., Sturgis, P., & Macleod Clark, J. (2006). Investigating the factors influencing professional identity of first year health and social care students. *Learn Health Soc Care, 5,* 55–68. https://doi.org/10.1111/j.1473-6861. 2006. 00119.x.

Allan, H., Traynor, M., Kelly, D., & Smith, P. (2016). *Understanding Sociology in Nursing* (pp. 176-180). Sage Publications.

American Nurses Association [ANA] (2008). *Position statement: Profession role competence.*

Apesoa-Verano, E. C. (2007). Educated Caring: The Emergence of Professional Identity among Nurses. *Qualitative Sociology 30*, 249–274. https://doi.org/ 10.1007/s11133-007-9069-6

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*(5), 469–480. Error! Hyperlink reference not valid.

Ashforth, B. E., Harrison, S. H., & Corley, K. G. (2008). Identification in organizations: An examination of four fundamental questions. *Journal of Management*, *34*(3), 325-374.

Ay, F. (2016). Registering Nursing Interventions in Electronic Environments in Accordance with Nursing Process: An Example from Turkey. *International Journal of Caring Sciences*, *6*(3), 332–338.

Benveniste, G. (1987). *Professionalizing the Organization: Reducing Bureaucracy to Enhance Effectiveness.* Jossey-Bass.

Biddle, B. J., Bank, B. J., & Slavings, R. L. (1987). Norms, preferences, identities, and retention decisions. *Social Psychology Quarterly*, *50*(4), 322–337. https://doi.org/10.2307/2786817.

Blais, K., & Hayes, J. S. (2016). Socialization to professional Nursing Roles. *Professional Nursing Practice – Concepts and Perspectives* (7th ed.). Unit 1 Chapter 2. Pearson Education Inc.

Blais, K., & Hayes, J. S. (2011). *Professional nursing practice: Concepts and perspectives* (6th ed.). Pearson Education, Inc.

Booth, R., Strudwick, G., McBride, S., O'Connor, S., & Lopez, A. L. S. (2021). How the nursing profession should adopt for a digital future. *BMJ, 373*(1190).

Bronfenbrenner, U. (1979). *The Ecology of Human Development.* Harvard University Press.

Carlson, E. (2013). Precepting and symbolic interactionism – a theoretical look at preceptorship during clinical practice. *Journal of Advanced Nursing, 69*(2), 457-464. https://doi.org/10.1111/j.1365-2648.2012. 06047.x

Caza, B. B., & Creary, S. J. (2016). *The construction of professional identity* [Electronic version]. Retrieved [11.2019], from Cornell University, SHA School site: https://scholarship.sha.cornell.edu/articles/878

Chan, E. A. & Schwind, J. K. (2006). Two nurse teachers reflect on acquiring their nursing identity. *Reflective Practice, 7*(3), 303-314. https://doi.org/10.1080/14623940600837426

Charmaz, K., Harris, S. R., & Irvine, L. (2019). *The Social Self and Everyday Life: Understanding the World Through Symbolic Interactionism*. John Wiley & Sons Co.

Cooley, C. H. (1902). *Human nature and the social order*. Charles Scribner's Sons

Creswell, J. W. (2014). *Research Design-Qualitative, Quantitative and Mixed Methods Approaches* (4th ed.). Sage Publications, Inc.

Crossley, J., & Vivekananda-Schmidt, P. (2009). The development and evaluation of a Professional Self Identity Questionnaire to measure evolving professional self-identity in health and social care students. *Medical Teacher, 31*(12)603-607. https://doi.org/10.3109/01421590903193547.

Davis, F. (1985). *A technology acceptance model for empirically testing new end-use information systems - theory and results.* PhD thesis. Massachusetts Institute of Technology. https://hdl.handle.net/1721.1/15192.

Davis, F. (1989), Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, *35*(8) 982–1003. https://doi.org/10.1287/mnsc.35.8.982

Debono, D., Taylor, N., Lipworth, W., Greenfield, D., Travaglia, J., Black, D., & Braithwaite, J. (2017). Applying the Theoretical Domains Framework to identify barriers and targeted interventions to enhance nurses' use of electronic medication management systems in two Australian hospitals. *Implementation Science: IS, 12*(1). https://doi.org/10.1186/s13012-017-0572-1

De Leeuw, J. A., Woltjer, H., & Kool, R. B. (2020). Identification of Factors Influencing the Adoption of Health Information Technology by Nurses Who Are Digitally Lagging: In-Depth Interview Study. Journal of Medical Internet Research, 22(8), e15630. https://doi.org/10.2196/15630

Dutton, J. E., Roberts, L. M., & Bednar, J. S. (2010). Pathways for positive identity construction at work: Four types of positive identity and the building of social resources. *Academy of Management Review*, *35*, 265-293.

Erikson, E. (1968). *Identity, youth and crisis.* W.W Norton & Co.

Farberman, H. A. (1985). The foundations of symbolic interaction: James, Cooley, and Mead. *Studies in Symbolic Interaction, Suppl 1*, 13–27.

Faris, R. E. L. (2021). Sociology. *Encyclopedia Britannica*. https://www. britannica.com/topic/sociology

Fishbein, M., & Ajzen, I. (1975) *Belief, attitude, intentions, and behavior. An introduction to theory and research.* Addison-Wesley.

Giddens, A. (2009). *Sociology, Polity.* Cambridge.

Giddens, A., Duneier, M., Appelbaum, R. P., & Carr, D. (2021). *Introduction to sociology.* ISBN 9780393428216 0393428214

Godfrey, N. (2020), How to Think/Act/Feel Like a Nurse: Forming Professional Identity in Nursing. *Dean's Notes, National Students Nurses Association*, *41*(4),1-4.

Goffman, E. (1969), *The presentation of self in everyday life.* Penguin books.

Haslam, S. A. (2003). *Social identity at work developing theory for organizational practice.* Psychology Press.

Hogg, M. A. (2000). Social identity and social comparison. In J. Suls & L. Wheeler (Eds.), *The Plenum series in social/clinical psychology. Handbook of social comparison: Theory*

and research (pp. 401–421). Kluwer Academic Publishers. https://doi.org/10.1007/978-1-4615-4237-7_19

Holden, R. J., & Karsh, B. T. (2010). The technology acceptance model: its past and its future in healthcare. Journal of biomedical informatics, 43(1), 159–172. https://doi.org/10.1016/j.jbi.2009.07.002

Ibarra, H. (1999). Provisional selves: Experimenting with image and identity in professional adaptation. *Administrative Science Quarterly*, *44*(4), 764—791.

Kruse, C. S., Stein, A., Thomas, H., & Kaur, H. (2018). The use of Electronic Health Records to Support Population Health: A Systematic Review of the Literature. *Journal of medical systems*, *42*(11), 214. https://doi.org/10.1007/s10916-018-1075-6

Kutney-Lee, A., Sloane, D. M., Bowles, K. H., Burns, L. R., & Aiken, L. H. (2019). Electronic Health Record Adoption and Nurse Reports of Usability and Quality of Care: The Role of Work Environment. *Applied clinical informatics, 10*(1), 129–139. https://doi.org/10.1055/s-0039-1678551

Lindesmith, A. R., & Strauss, A. L. (1956). *Social psychology*. Holt, Rinehart and Winston.

Magnusson, L., Hanson, E., & Borg, M. (2004). A literature review study of information and communication technology as a support for frail older people living at home and their family carers. *Technology and Disability, 16*(4), 223- 235.

Marcia, J. (1994). *The empirical study of ego identity.* In H. Bosma, T. Graafsma, H, Grotevant, & D. Levita (Eds.), *Identity and Development: An interdisciplinary Approach*. Sage.

McPherson, N. G. (2008). The role of sociology in nurse education: a call for consistency. *Nurse education today, 28*(6), 653–656. https://doi.org/10.1016/j. nedt.2008.05.002

Mead, G. H. (1934). *Mind, self, and society*, University of Chicago Press.

Merton, R. (1957). The Role-Set: Problems in Sociological Theory. *The British Journal of Sociology, 8*(2), 106-120. https://doi.org/10.2307/587363

Miel, D., Phoenix, A., & Thomas, K. (2002). *Mapping Psychology*. British Open University Press.

Ortega Egea, J. M., Gonzales, M. V. R. (2011). Explaining physicians' acceptance of EHCR systems: An extension of TAM with trust and risk factors. *Computers in Human Behavior, 27*(1), 319-33. https://doi.org/10.1016/j.chb.2010.08.010

Pham, L. (2008). *A review of key paradigms: positivism, interpretivism and critical inquiry.* https://doi.org/10.13140/RG.2.2.13995.54569

Porter-O'Grady, T. (2003). Of hubris and hope: Transforming nursing for a new age. *Nursing Economics*, *21*(2), 59-64.

Pramilaa, R. (2013). Application of Nursing Informatics: Need to Transform into Reality. *International Journal of Nursing Education*. https://doi.org/10.5958/ j.0974-9357.5.1.038

Pullen, R. L. (2021). Professional identity in nursing practice, *Nursing Made Incredibly Easy! 19*(2), 55-56. https://doi.org/10.1097/01.NME.0000732012.99855.78

Sanchez-Franco, M., & Roldan, J. (2005) Web acceptance and usage model A comparison between goal-directed and experiential web users. *Internet Research, 15*, 21-48.

Shahim, A., Lotfib, M., & Rahmani, A. (2011). Professional socialization of nursing graduates of Tabriz University of Medical Sciences. *Nursing and Midwifery Journal, 20,* 19–25. PMC4145501.

Siebert, D. C., & Siebert, C. F. (2005). The caregiver role identity scale: A validation study. *Research on Social Work Practice*, *15*, 204-212.

Smedley, A. (2005). The importance of informatics competencies in nursing: An Australian perspective. *Computers, Informatics, Nursing, 23*(2), 106-110.

Sparks, P. (2000). Subjective expected utility-based attitude-behavior models: The utility of self-identity. In D. J. Terry & M. A. Hogg (Eds.), *Attitudes, behavior, and social context*: *The role of norms and group membership Applied social research* (pp. 31-46). Lawrence Erlbaum Associates, Inc. Publishers.

Stokowski, L. A. (2013). Electronic nursing documentation: Charting new territory. *Medscape*. https://www.medscape.com/viewarticle/810573_2.

Szajna, B. (1996). Empirical Evaluation of the Revised Technology Acceptance Model. *Management Science*, *42*, 85-92.

Tajfel, H. (1974). Social identity and intergroup behaviour. *Social Science Information*, *13*(65), 65-93.

Tajfel, H., & Turner, J. (1979). An Integrative Theory of Intergroup Conflict. *Organizational Identity: A Reader,* 56-65.

Taylor, S., & Todd, P. (1995) An integrated model of waste management behavior: a test of household recycling and composting intentions. *Environment and Behavior*, *27*, 603-630.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology   acceptance model: Four longitudinal field studies. *Management Science*, *46*(2), 186-204. https://doi.org/10.1287/mnsc.46.2.186.11926

While, A, & Dewsbury, G. (2011). Nursing and information and communication technology (ICT): A discussion of trends and future directions. *International Journal of Nursing Studies*, *48*(10), 1302-1310.

Williams, E. A., & Connaughton, S. L. (2012). Expressions of identifications: Nature of talk and identity tensions among organizational members in a struggling   organization. *Communication Studies*, *63*(4), 457-481. https://doi.org/10. 1080/10510974.2011.630439

Zadvinskis, I. M., Garvey Smith, J., & Yen, P. (2018). Nurses' Experience with Health Information Technology: Longitudinal Qualitative Study. JMIR Med Inform, 6(2), e38. https://doi.org/10.2196/medinform.8734

APPENDIX

Appendix 1 – Letter to the participants

Dear Participants,

I am writing to ask for your collaboration with this research project. This study requires the use of a questionnaire to understand the relationship between Electronic Medical Records (EMR) usage and Professional Self-Identity. I would like to invite you to consider participating in a research study by completing an anonymous questionnaire. If you decide to take a part, I would like to confirm you that the data will be protected from anyone but the researcher and PhD Coordinator. The success of the research is highly dependent on your participation.

You are free to withdraw your participation at any time.

Thank you for your cooperation,

Sincerely,

The researcher

Appendix 2 - TAM2 Measurement Scales and Reliabilities

Intention to Use

Assuming I have access to the system, I intend to use it.

Given that I have access to the system, I predict that I would use it.

Perceived Usefulness

Using the system improves my performance in my job.

Using the system in my job increases my productivity.

Using the system enhances my effectiveness in my job.

I find the system to be useful in my job.

Perceived Ease of Use

My interaction with the system is clear and understandable.

Interacting with the system does not require a lot of my mental effort.

I find the system to be easy to use.

I find it easy to get the system to do what I want it to do.

Subjective Norm

People who influence my behavior think that I should use the system.

People who are important to me think that I should use the system.

Voluntariness

My use of the system is voluntary.

My supervisor does not require me to use the system.

Although it might be helpful, using the system is certainly not compulsory in my job.

Image

People in my organization who use the system have more prestige than

those who do not.

People in my organization who use the system have a high profile.

Having the system is a status symbol in my organization.

Job Relevance

In my job, usage of the system is important.

In my job, usage of the system is relevant.

Output Quality

The quality of the output I get from the system is high.

I have no problem with the quality of the system's output.

Result Demonstrability

I have no difficulty telling others about the results of using the system.

I believe I could communicate to others the consequences of using the

system.

The results of using the system are apparent to me.

I would have difficulty explaining why using the system may or may not be beneficial.

All items will be measured on a 7-point Likert scale:

1   strongly disagree,

2   moderately disagree,

3   somewhat disagree,

4   neutral (neither disagree nor agree),

5   somewhat agree,

6   moderately agree,

7   strongly agree.

Appendix 3 - Professional Self Identity Questionnaire

Please indicate (by circling the appropriate number) how you feel at present if you were undertaking the following activities. If you feel an activity does not apply to you, please circle N/A. All data is anonymized.

The Professional Self Identity Questionnaire (PSIQ) is a 9-item inventory rated on a 7-point Likert-type scale. It measures the degree to which one feels they are professional- as in a professional state of mind.

1.   When I am working with other healthcare professionals, I feel like an

Experienced   Newly qualified

1   2   3   4   5   6   N/A

2.   When I am communicating with patients or clients I feel like a

Experienced   Newly qualified

1   2   3   4   5   6   N/A

3.   When assessing a patients or clients I feel like a

Experienced   Newly qualified

1   2   3   4   5   6   N/A

4.   When engaging with others in a culturally diverse healthcare environment I feel like a

Experienced   Newly qualified

1   2   3   4   5   6   N/A

5.   When I am considering ethical or moral issues I feel like a

Experienced   Newly qualified

1   2   3   4   5   6   N/A

6. When consulting/using patient or client records I feel like a

Experienced   Newly qualified

1   2   3   4   5   6   N/A

7. When I find myself in an emergency involving a patient or client, I feel like a

Experienced   Newly qualified

1   2   3   4   5   6   N/A

8. When reflecting on my practice (experiences) to identify my learning needs I feel like a

Experienced   Newly qualified

1   2   3   4   5   6   N/A

9. When teaching others, I feel like a

Experienced   Newly qualified

1   2   3   4   5   6   N/A

Currently I am – (seniority years):

   1-5

   5-10

   10-15

   15-20

   20+

I work :   Full-time   I work Part-time

Working department : ----------

Gender :   Male   Female   Age

THANK YOU

Appendix 4 – Approval of the university Ethics of Research Committee

"Alexandru Ioan Cuza" University of Iasi
Faculty of Philosophy and Social-Political Sciences
Ethics of Research Committee
Bd. Carol I no. 11, 700506 IASI, ROMANIA
tel. +40 232 201054; fax. +40 232 201154
E-mail: admfil@uaic.ro

APPROVAL

We hereby confirm that Becky Tsarfati's doctoral research proposal, *The Effect of the Use of Computer Technology on Nurses' Professional Identity*, meets the criteria of the Ethics of Research Committee of the Faculty of Philosophy and Social-Political Sciences, "Alexandru Ioan Cuza" University of Iasi.

The validity of the certificate is 31.12.2022.

Prof. George Bondor, PhD
President of the Ethics of Research Committee

Dean of the Faculty of
Philosophy and Social-Political Sciences,
Prof. Conţiu Tiberiu Şoitu, PhD

Appendix 5- Table No. III.1: Multiple hierarchical regression for the perceived usefulness of the use of technology, with cognitive instrumental and social impact processes (N = 198)

	B	*SE*		*p*	**Adj.R^2**
Step 1					.13, p < .001
Seniority	0.04	0.01	.36	< .001	
Gender (male)	-0.32	0.24	-.09	.181	
Step 2					.47, p < .001
Seniority	0.02	0.01	.19	< .001	
Gender (male)	-0.01	0.19	-.01	.946	
Perceived ease of use	0.27	0.08	.24	< .001	
Job relevance	0.01	0.01	.19	.008	
Output quality	0.24	0.06	.25	< .001	
Result demonstrability	0.05	0.08	.05	.532	
Subjective norm	0.08	0.05	.09	.126	
Image	0.03	0.05	.04	.480	
F (8, 189)					22.47, p < .001

Appendix 6 – Table No. III.2: Positive aspects of the application of computer technology

Positive aspects of the application of computer technology	Access to information	"*My experience working with electronic registration is very positive, allows me quick access to the patients' database, a computerized work environment has created an order for me at work*"
	Efficiency and improvement in nursing practice	"*Since the introduction of a computerized sheet, I make the registration and reporting in a clear, immediate manner, there is access to a lot of data in a very short period of time, which in my opinion increases the efficiency of the work*".
	Collaboration between nursing staff and computer staff	"*Some of the nursing staff had difficulty adapting to a computerized sheet, but thanks to the support of the nurse in charge, and the staff of the computer unit, the transition to electronic registration was not terrible overall*".
	Prevention of errors in registration and reporting	"*A lot of information can be received in a short period of time, the writing is legible, and it prevents mistakes in registration, today I have no doubt that it is easier for the entire nursing staff to function with electronic registration*"

Appendix 7 – Table No. III.3: Difficulties in applying computer technology

	Lack of knowledge in using a new computer system	"*At first it was very difficult because we did not know the system*"
Difficulties in applying computer technology	Difficulty adapting to a new registration and reporting method	"*I know that some of the nursing staff had difficulty adjusting to a computerized sheet*"
	Time consuming	"*At first there were many complaints about the lack of time for managing the treatment due to the fact that most of the treatment time was spent on registering on the computer*"
	A sense of increased technical engagement	"*In my opinion, the computerized sheet does create order, but it also creates technical work without the nurses' need to think about how the recorded data will be concentrated and what it is used for, everything remains at a technical level of registration*".

Appendix 8 – Table No. III.4: Distribution of the items of acceptance of technology (n = 205-213)

	Disagree (scores 1-2) n (%)	Neutral (scores 3-5) n (%)	Agree (scores 6-7) n (%)	M (SD)
Perc. usefulness 1	2 (1.0)	93 (44.3)	115 (54.8)	5.64 (1.25)
Perc. usefulness 2	7 (3.3)	105 (50.2)	97 (46.4)	5.32 (1.36)
Perc. usefulness 3	4 (1.9)	90 (43.3)	114 (54.8)	5.50 (1.31)
Perc. usefulness 4	1 (0.5)	94 (46.1)	109 (53.4)	5.57 (1.32)
Perc. ease of use 1	1 (0.5)	100 (48.1)	107 (51.4)	5.56 (1.21)
Perc. ease of use 2	7 (3.3)	113 (53.8)	90 (42.9)	5.21 (1.34)
Perc. ease of use 3	2 (1.0)	88 (43.3)	113 (55.7)	5.50 (1.26)
Perc. ease of use 4	18 (8.5)	111 (52.6)	82 (38.9)	4.92 (1.49)
Job relevance 1	0 (0)	80 (40.2)	119 (59.8)	5.86 (1.19)
Job relevance 2	3 (1.5)	66 (33.0)	131 (65.5)	5.98 (1.27)
Output quality 1	4 (2.0)	84 (42.0)	112 (56.0)	5.54 (1.28)
Output quality 2	8 (4.0)	95 (47.3)	98 (48.8)	5.25 (1.47)
Result demonstrability 1	4 (2.0)	81 (40.9)	113 (57.1)	5.61 (1.40)
Result demonstrability 2	3 (1.5)	73 (36.3)	125 (62.2)	5.76 (1.27)
Result demonstrability 3	2 (1.0)	88 (44.0)	110 (55.0)	5.66 (1.25)
Subjective norm 1	9 (4.3)	106 (51.0)	93 (44.7)	5.21 (1.49)
Subjective norm 2	5 (2.4)	118 (57.0)	84 (40.6)	5.15 (1.40)
Image 1	15 (7.5)	119 (59.8)	65 (32.7)	4.74 (1.62)
Image 2	29 (14.6)	106 (53.3)	64 (32.2)	4.45 (1.77)
Image 3	19 (9.5)	118 (59.0)	63 (31.5)	4.64 (1.65)

Appendix 9 – Table No. III.5: T-tests for the research variables by place of work (N = 213)

	Community M (SD)	Hospital M (SD)	t(df)	p
Professional identity	5.01 (0.79)	5.15 (0.73)	$t(206) = 0.96$	.337
Cognitive instrumental processes (total score)	5.28 (0.95)	5.58 (0.86)	$t(211) = 1.88$	.062
Social impact processes (total score)	4.85 (1.13)	4.89 (1.02)	$t(211) = 0.21$	.837
Perceived usefulness	5.44 (1.24)	5.49 (1.15)	$t(211) = 0.23$	.818
Perceived ease of use	5.04 (0.96)	5.33 (1.02)	$t(211) = 1.54$	.125
Job relevance	5.69 (1.21)	5.95 (1.09)	$t(203) = 0.93$	.353
Output quality	5.04 (1.14)	5.46 (1.24)	$t(201) = 1.83$	.069
Result demonstrability	5.25 (1.14)	5.72 (1.14)	$t(205) = 2.24$	**.026**
Subjective norm	5.21 (1.35)	5.18 (1.35)	$t(209) = -0.15$	.879
Image	4.54 (1.35)	4.62 (1.31)	$t(204) = 0.33$	.741

Appendix 10- Table No. III.6: T-tests for the research variables by type of hospital department (N = 178)

	General departments M (SD)	Requiring professional studies M (SD)	t(df)	p
Professional identity	5.08 (0.74)	5.31 (0.68)	$t(172) = 2.33$	**.021**
Cognitive instrumental processes (total score)	5.52 (0.88)	5.70 (0.79)	$t(176) = 1.31$	.193
Social impact processes (total score)	4.91 (0.91)	4.85 (1.20)	$t(92.14)^{(1)} = -0.35$	.730
Perceived usefulness	5.41 (1.17)	5.66 (1.09)	$t(176) = 1.35$	.180
Perceived ease of use	5.28 (1.07)	5.44 (0.90)	$t(176) = 1.01$	.314
Job relevance	5.87 (1.09)	6.11 (1.08)	$t(169) = 1.61$	.110
Output quality	5.48 (1.21)	5.44 (1.32)	$t(167) = -0.20$	.839
Result demonstrability	5.64 (1.17)	5.88 (1.06)	$t(171) = 1.30$	.194
Subjective norm	5.19 (1.33)	5.16 (1.40)	$t(174) = -0.14$	.886
Image	4.67 (1.19)	4.54 (1.53)	$t(90.72)^{(1)} = -0.55$	.583

$^{(1)}$ - t for unequal variances.

Appendix 11 – Table No. III.7: Pearson correlations between age and seniority in nursing and the research variables (N = 213)

	Age	Seniority in nursing
Professional identity	.38***	.48***
Cognitive instrumental processes (total score)	.20**	.32***
Social impact processes (total score)	.11	.13
Perceived usefulness	.26***	.37***
Perceived ease of use	.06	.11
Job relevance	.23***	.38***
Output quality	.15*	.24***
Result demonstrability	.06	.14
Subjective norm	.13	.17*
Image	.05	.01

*p<.05, **p<.01, ***p<.001

Appendix 12 – Table No. III.8: T-tests for the research variables by gender (N = 213)

	Male M (SD)	Female M (SD)	t(df)	p
Professional identity	4.88 (0.90)	5.16 (0.71)	t(206) = 1.49	.138
Cognitive instrumental processes (total score)	5.18 (0.86)	5.58 (0.87)	t(211) = 2.14	**.033**
Social impact processes (total score)	4.53 (0.82)	4.94 (1.05)	t(211) = 1.87	.062
Perceived usefulness	5.16 (1.21)	5.53 (1.15)	t(211) = 1.49	.137
Perceived ease of use	4.92 (0.92)	5.33 (1.02)	t(211) = 1.92	.056
Job relevance	5.60 (1.12)	5.95 (1.11)	t(203) = 1.48	.141
Output quality	5.22 (1.18)	5.42 (1.24)	t(201) = 0.75	.452
Result demonstrability	5.00 (1.19)	5.73 (1.12)	t(205) = 3.05	**.003**
Subjective norm	4.92 (1.19)	5.22 (1.37)	t(209) = 1.04	.300
Image	4.13 (1.15)	4.68 (1.33)	t(204) = 1.95	.053

Appendix 13 – Table No. III.9: Distribution of the items of Professional identity (n = 208)

	Newly qualified (scores 1-2) n (%)	Moderately qualified (Scores 3-4) n (%)	Qualified (Score 5) n (%)	Highly qualified (scores 6) n (%)	M (SD)
Teamwork	1 (0.5)	52 (25.1)	54 (26.1)	100 (48.3)	5.15 (0.98)
Communication	2 (1.0)	34 (16.3)	57 (27.4)	115 (55.3)	5.29 (0.96)
Performing assessments	2 (1.0)	46 (22.3)	47 (22.8)	111 (53.9)	5.26 (0.94)
Cultural awareness	4 (1.9)	53 (25.7)	75 (36.4)	74 (35.9)	4.97 (1.01)
Ethical awareness	5 (2.4)	50 (24.2)	76 (36.7)	76 (36.7)	4.99 (1.02)
Using records	3 (1.5)	33 (16.3)	75 (36.9)	92 (45.3)	5.21 (0.90)
Dealing with emergencies	4 (2.0)	39 (19.1)	66 (32.4)	95 (46.6)	5.17 (0.98)
Reflection	2 (1.0)	54 (26.3)	64 (31.2)	85 (41.5)	5.03 (1.04)
Teaching	5 (2.5)	46 (22.8)	49 (24.3)	102 (50.5)	5.10 (1.15)

Appendix 14 – Table No. III.10: Means, standard deviations, and Pearson correlations for the research variables (N = 213).

	M (SD)	2.	3.	4.	5.	6.	7.	8.	9.	10.
1.Professional identity	5.13 (0.74)	.42***	.21**	.32***	.24***	.53***	.24***	.36***	.26***	.06
2.Cognitive instrumental processes (total score)	5.53 (0.88)		.39***	.79***	.77***	.71***	.76***	.80***	.45***	.14
3. Social impact processes (total score)	4.89 (1.03)			.33***	.28***	.37***	.18**	.31***	.79***	.77***
4.Perceived usefulness	5.48 (1.16)				.51***	.52***	.52***	.48***	.38***	.12
5.Perceived ease of use	5.28 (1.01)					.40***	.46***	.63***	.33***	.10
6.Job relevance	5.91 (1.11)						.37***	.52***	.46***	.11
7.Output quality	5.39 (1.23)							.47***	.25***	.03
8.Result demonstrability	5.64 (1.15)								.32***	.16*
9.Subjective norm	5.18 (1.35)									.20**
10.Image	4.61 (1.31)									

*p<.05, **p<.01, ***p<.001.

Appendix 15 – Table No. III.11: The impact of using technology on nurses' professional identity

The impact of using technology on nurses' professional identity	Progress	"*I'm glad they have finally let the nurses move to the forefront of digitalization as well*".
	Pride and improvement of professional image	"*I am very glad that in our ward the nurse in charge insisted on using a computerized record even when not all the wards in the hospital worked this way*"
	Dissonance in the role of a nurse	"*It evoked in me a feeling of missing out, as if I did not fulfill my role as I know it should be. Since that time, I tried to be free and attentive to each patient and I learned to manage my time differently and divide it between patients and computer*"
	Feelings of frustration and conflict	"*As part of nursing studies, we were taught the importance of independent thinking, interpretation of data based on extensive knowledge, and critical thinking, while in working with a spreadsheet, despite all the benefits I mentioned earlier, there is no room for expressing knowledge-based interpretation which appears on the computer, all this is a bit frustrating*".