A STUDY ON THE IMPACT OF PATIENT CENTERED MEDICAL HOME (PCMH)

IMPLEMENTATION ON NURSING WORK PRACTICE

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The Supervisory Committee certifies that this ***disquisition*** complies with North Dakota State University's regulations and meets the accepted standards for the degree of

MASTER OF SCIENCE

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ABSTRACT

Primary care and nursing are important components of the U.S. healthcare system and are facing challenges of quality, access, cost, time spent and inefficiencies of clinical activities. Patient Centered Medical Home (PCMH) is a newly developed care model which has the potential to overcome these challenges. The present study uses a questionnaire approach to find the impact PCMH implementation may have on nursing practice and subsequently primary care. Analysis of the data collected from the questionnaire revealed some surprising results about the nursing practice. For example nurses spend less time on direct care and more time on indirect care and documentation. The nursing demand in terms of Full Time Equivalent (FTE) for nurses decreases. The future demand for nurses (not in FTE) shows an increase after PCMH implementation. The satisfaction level and overall health of patients, patient readmission, job satisfaction of nurses and department productivity shows improvement after PCMH implementation.

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LIST OF ABBREVATIONS

AAFP………………………………………..American Academy of Family Physicians

ACP………………………………………..American College of Physicians

AANP……………………………………...American Academy of Nurse Practitioners

ANA…………………………………………American Nurses Association

AOA………………………………………..American Osteopathic Association

AAP………………………………………..American Academy of Pediatrics

FTE……………………………………….....Full Time Equivalent

GDP………………………………………..Gross Domestic Product

IRB………………………………………...Institutional Review Board

IT…………………………………………..Information Technology

IOM………………………………………..Institute of Medicine

LPN………………………………………..Licensed Practical Nurse

MA…………………………………………Medical Assistant

NP………………………………………….Nurse Practitioner

PCMH……………………………………...Patient Centered Medical Home

PCPCC…………………………………….Patient Centered Primary Care Collaborative

RN………………………………………...Registered Nurse

WHO……………………………………...World Health Organization

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CHAPTER 1. INTRODUCTION

The U.S. healthcare system is facing a crisis right now. It does not provide value equivalent to the amount of money spent. According to the 2004 Institute of Medicine (IOM) report, "The United States is among the few industrialized nations in the world that does not guarantee access to healthcare for its population." This failure to provide care in spite of the fact that "[t]otal healthcare spending in the U.S. was 15.2% of its GDP in 2008, which is the highest in the world" (WHO, 2011).The ongoing debate about the healthcare reforms raises issues about the quality, access, efficiency, and cost of the U.S. healthcare system.

One way to answer these issues is to improve primary care. Primary care is an important component of the U.S. healthcare system and is the most widely used medium of care. The higher number of patients utilizing primary care, is bound to put strain and pressure on both the delivery of care and on the quality of care. In order to overcome the critical issues facing the U.S. healthcare system, there is a need to fortify the primary care.

Primary care can be strengthened by new models of care which, after implementation, are able to improve the current state of primary care. Patient Centered Medical Home (PCMH) is one such kind of care model. The American Academy of Family Physicians (AAFP), American Academy of Pediatrics (AAP), American College of Physicians (ACP), American Osteopathic Association (AOA), 2007 have released the Joint principles of the Patient Centered Medical Home which gives an account of the characteristics of PCMH. Friedberg, Safran, Coltin, Dresser, & Schneider (2008) mentions PCMH as the model care which will be able to advance primary care. The PCMH

principles aim to increase coordination of care, continuous improvement of quality and safety, and enhance access (Friedberg et al., 2008).

Nurses are an important part of the U.S. healthcare system involved in providing primary care. Indeed, nurses have their own share of challenges in the current system. Current and past literature lists the challenges the nursing profession has to face. However very little is known about the impact PCMH implementation can have on nurses providing primary care.

The present research is an attempt to identify the impact of PCMH implementation on the working pattern and staffing levels of nurses providing primary care. The outcomes of this research study will be helpful to identify challenges and the positive impact on the working pattern and staffing levels of nurses after the PCMH implementation. The positive impact of PCMH implementation will also be helpful to overcome the current critical issues facing the U.S. healthcare system.

CHAPTER 2. BACKGROUND LITERATURE

The following section contains the literature review of the important terms related to the main topic of discussion. The literature review will be helpful in building the research problem and later the research hypothesis.

2.1. U.S. Healthcare

The healthcare system of the Unites States is facing some critical issues like rising costs, variable quality of care, and lack of proper approach towards appropriate care which need immediate attention (Adams et al., 2009). Healthcare spending in the U.S. is 2.4 times higher as compared to other developed countries and is bound to rise 67.9 percent in the next decade (Sisko et al., 2009). Also there is a worry about access of care for the 45.7 million uninsured U.S population (DeNavas-Walt, Proctor, Smith, and U.S. Census Bureau, 2008).

2.2. Primary Care

"Primary care is the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal healthcare needs, developing a sustained partnership with patients, and practicing in the context of family and community" (Institute of Medicine, 1994, p. 15). A large amount of patients give first preference to primary care physician over a specialist (Grumbach et al., 1999). According to the American Academy of Family Physicians (AAFP), Primary care helps in facilitating a crucial point which helps in providing core medical and preventive care for patients (Starfield, 1998). Primary care can reduce cost and at the same time maintain quality (Bodenheimer, 2006). It also provides the potential to bring down the inequality in

healthcare and enhancing people's lives and increasing their overall efficiency (Schoen et al., 2004).

2.2.1. Challenges in primary care.

The U.S primary care system fairs poorly when it comes to "access, coordination and physician-patient experiences" (Schoen et al., 2004,p.500).The fee for service type of reimbursement pattern which is used right now, does not cover all the primary care activities (Gottschalk & Flocke, 2005). There is dissatisfaction about access to primary care (Grumbach et al., 1999) due to the short and quick visit time with lots of other tasks at hand (Bodenheimer, 2006).The primary care tasks result in physician spending 10.6 hours per day in patient care and 7.4 hours per day more for giving evidence based care (Bodenheimer, 2006).Due to the increasing demand of time patients are not able to schedule timely appointments. (Bodenheimer, 2006). Also there is a rise in large waiting time resulting in a dip in the standard of care (Bodenheimer, 2006).

Primary care professional societies are coming up with new care models and are also checking its functioning (Bodenheimer, 2006).In order to improve the primary care in the U.S. there is a need to undertake activities which can throw some light on the challenges facing primary care and how can those be overcome Bodenheimer (2006). Look for clever stratagem from primary care systems around the world and make necessary changes if required, to best suit the U.S. primary care system (Starfield, 1998; Davis et al., 2004).

2.3. Patient Centered Medical Home (PCMH)

Patient Centered Medical Home (PCMH) is an approach to provide comprehensive primary care to all types of patients and it provides care that is "accessible, continuous, comprehensive, coordinated and delivered in the context of family and community" (AAFP et al., 2007, p. 1). The PCMH will be able to transform the U.S. healthcare system by superseding the care which lacks coordination, critical focus, and continuous care with "coordinated, proactive, preventive, acute, chronic, long term end of life care" (Adams et al., 2006, p.).

According to AAFP el al., 2007, the principles of PCMH are:

- **Personal Physician:** Patients always remain the physician's first priority and provides   the patient the best possible care by all means (AAFP el al., 2007, p. 1). Physician provides care that is uninterrupted and complete (AAFP el al., 2007, p. 1).

- **Physician directed medical practice:** Continuous care is provided to the patients by the physician along with other clinical professionals (AAFP el al., 2007, p. 1). The physician acts as the leader of the team of clinical professionals (AAFP el al., 2007, p. 1).

- **Whole person orientation:** It is the duty of the physician to make available all the required at for the patient (AAFP el al., 2007, p. 1). If required the physician should make available "acute care, preventive services and end life of care."(AAFP et al., 2007,p.1)

- **Care is coordinated and/or integrated:** Physician must coordinate care among all the required healthcare sources which are necessary for the patients well being (AAFP et al., 2007, p. 1). It includes "subspecialty care, hospitals, home health agencies, nursing homes" and "patient's community (e.g., family, public and private community based services)." (AAFP et al., 2007, p. 1) .Patients receives care by all means possible, at the right place and at the right time in a "culturally and linguistically appropriate manner." (AAFP et al., 2007, p. 1)

- **Quality and safety:** The medical home provides its patient with a pre defined care process thus enabling its patients to achieve the best health results along with sympathy and strong support from physicians, patients, and patient's family (AAFP el al., 2007, p. 2). Physicians, patients and families participate in initiatives that are related to providing a better patient experience and at the same time conduct "performance measurement and improvement"(AAFP et al., 2007, p. 2).Practices are encouraged to gain certification as a medical home from a non-government agency (AAFP et al., 2007, p. 2). Use of "information technology" (AAFP et al., 2007, p. 2) is also encouraged.

- **Enhanced access:** It includes services such as flexibility in setting up an appointment, increase the operating hours, and new ways to communicate between patients, healthcare professionals and support staff (AAFP et al., 2007, p. 2).

- **Payment:** The payment structure should include all the value added activities provided to patients in PCMH (AAFP el al., 2007, p. 2). The payment should include the clinical and non clinical staff members, work done other than the face to

face visit, studying the lab and other results from a far away destination, use of IT to enhance the patient experience, and proper care coordination (AAFP et al., 2007, p. 2). It should provide physicians incentives for maintaining the quality of care and also a part of the savings resulted from decreased patient visits. A different reimbursement pattern for face to face visits (AAFP et al., 2007, p. 2). Incentives in the form of payments to physicians due to decrease in hospitalization and also incentives for maintaining the desired standard of care (AAFP et al., 2007, p. 2)

2.4. Nurses

The following section presents overview of one of the important professional "NURSE" involved in the delivery of healthcare. Nursing being a very specialized profession due to the involvement of nurses in almost all the specialized sections of healthcare. Thus it becomes necessary to understand the definition of a nurse along with the types of nurses involved in providing care and the clinical activities they are involved in.

"The nurse's primary intellectual concern and functions related thereto is that of helping each person attain his highest level of general health. The nurse's focus is on assessing people to regain health and the well or near well to maintain or attain health through selective application of nursing science and the use of nursing strategies." (Sacks, 2003) According to the American Nurses Association (ANA) code of Ethics for registered nurses "Nurse's primary commitment is to the patient, whether an individual, family, group, or community" ANA (2005)

2.4.1. Classification of nurses in this research study.

Nurses can be classified on the basis of the training they receive. The different levels of training enables them to undertake various clinical activities. What follows is a brief overview of the types of nurses involved in this research includes the clinical activities they perform and their places of work.

2.4.1.1. Registered Nurse (RN).

RN is an individual who has been granted a legal permission to pursue a nursing profession (Craven and Hirnle, 2000). Clinical activities performed by Registered nurse include, giving patient care, coordinating care with other healthcare resources, carryout and interpret results of diagnostic tests, handle medical instruments, documentation, teaching patients and public about potential health ailments, and giving suggestions and provide comfort to the close members of the patient's family (Bureau of Labor Statics, 2012).

2.4.2.2. Nurse Practitioner (NP).

NP is a Registered Nurse (RN) who has gained a higher level of training and education than RN, which enables the NP to undertake various direct patient care activities (American College of Nurse Practitioners, 2012). Other than the direct patient care activities like carrying out patient examination, identify and cure minor ailment and injures, interpret test results and counseling, NP's also authorize the use of medicine for patients in all 50 states and also to run their own practice in some states (Sacks, 2003).

2.4.3.3. Licensed Practical Nurse (LPN).

LPN undertake nursing care activities under the oversight of a RN (Craven and Hirnle, 2000). LPN measure the blood pressure, pulse and temperature, gather information

about the medication prescribed and any side effects of the medication on patient and document patient care plan (Sacks, 2003).

2.4.4.4. Medical Assistant (MA).

MA not only perform patient care activities under the guidance of licensed medical professional but also undertake administrative activities (American Association of Medical Assistants, 2012). MA's duties include taking notes about patient history, measuring vital signs, helping physicians examine patients, administering injections as instructed by physicians, setting up appointments, and preparing blood to be sent to lab for tests (Bureau of Labor Statics, 2012).

2.4.2. Nursing work task categories

The following operational definitions were used for the listed nursing work task categories.

1) **Direct care:** "All activities involving direct interaction between the nurse and patient/family" Activities which are performed face to face in the presence of nurse and patient/family. (Williams, Harris, Turner-Stokes, 2009, p. 2101)

2) **Indirect care non documentation:**

   - *Medication administration:* Activities related to preparing, giving and evaluating the effectiveness of prescription and nonprescription drugs ("Medication Administration", 2012)

   - *Unit Related Functions:* Activities which help in the normal functioning of the nursing unit/ward (Williams et al., 2009).

- *Care Coordination:* Care coordination involves a conscious effort to make available all the healthcare resources available to the patient and also coordinate the interaction between the patient and the type of healthcare resource being utilized by the patient. There should also be a reliable channel to exchange information between the resources providing care.("Care Coordination", 2012)

3) **Indirect care documentation:** The process which involves the description of care provided to the patient, current patient condition, "interventions" provided to the patient and the impact of these "interventions" on the health outcomes of the patient (Rehan,2010)

4) **Personal:** Activities which help the nurse to relax (Williams et al., 2009)

2.4.3. Challenges faced by nurses.

As do professionals in any other field, nurses do come across some challenges. In the study of Hendrich, Chow, Skierczynski, & Lu, 2008 it was stated that nurses tend to spend more time on indirect patient care activities than direct care activities. Demanding patient needs result in the increase of indirect activity time (Chaboyer et al., 2008). Additional challenge nurses face are interruptions and multitasking which puts at risk the patient care which resulting in miscommunication and further medical errors Edwards et al., (2009). Interruptions and multitasking also have a financial impact on the institution as pointed out by Edwards et al., (2009). Implementation of new technology also results in interruptions as observed by Tang, Mazabob, Weavind, Thomas, & Johnson, (2006) ; Prescott, Phillips, Ryan, & Thompson (1991) and Duffield, Gardner, & Catling-Paull,(2008) claim that nurses spend a large amount of nursing time on non-patient related

tasks and must complete tasks which are the responsibility of a less skilled worker. This results in underutilization of nurses expertise and patient care time (Prescott et al., 1991; Duffield et al., 2008). Other challenges include duplication of documentation and operational failures in medical administration (Hendrich et al., 2008).

2.4.4. Nurse Practitioners (NPs) in PCMH.

The current literature only talks about the involvement of the NPs in PCMH. The NPs are group of professionals providing care by utilizing the high level of skill and knowledge at their disposal. However there is major difference in the way physicians and NP's become eligible to provide care for patients. NP's have a limited scope of practice in some states, as per the legislation. Thus according to the Joint Statement on NP in PCMH demonstration projects, "Physicians and NPs complete their education and training with different types and levels of skills knowledge and abilities that are not equivalent but may be complimentary" (American Academy of Family Physicians, American Academy of Pediatrics, American College of Physicians, American Osteopathic Association, Joint Statement on NP in PCMH Demonstration Projects, 2009, p. 1). Physicians and NP's have a common goal of providing the best possible care to patients which helps the patients to achieve their best health (AAFP et al., 2009).

2.4.4.1. NPs principles in PCMH.

The American Academy of Nurse Practitioners (AANP), December 2007 state that, NP's follow the principles of PCMH as mentioned in the Joint Principles of the PCMH, March 2007. Table 1. lists those principles,

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Table 1

Comparison of PCMH Principles.

PCMH	
Principles for NPs by AANP	*Principles from the Joint Statement*
Personal healthcare provider	Personal Physician
Primary care provider directed practice	Physician directed medical practice
Whole person orientation	Whole person orientation
Care coordinated and integrated	Care coordinated and integrated
Quality and safety	Quality and safety
Enhanced access	Enhanced access
Appropriate payment	Appropriate payment

American Academy of Family Physicians(AAFP), American Academy of Pediatrics(AAP), American College of Physicians(ACP), American Osteopathic Association(AOA) Joint Principles of the Patient Centered Medical Home, March 2007.
American Academy of Nurse Practitioners, Nurse Practitioners: Promoting Access to Coordinated Primary Care, December 2007

Thus it becomes clear from the above table 1 that there is not much difference in the PCMH principles for NP's and physicians. However it should be noted that there is difference in the skill set, training, and certification they receive. The following are some specific applications for the NP's in PCMH,

- **Personal Healthcare Provider:** NP have been providing primary care for a very long period of 40 years. NPs are high quality providers who practice in primary, ambulatory, acute, specialty and long term care. Provide high quality and cost effective healthcare services (AANP, 2007, para. 6). NP also actively support health promotion and ways to avoid spread of diseases (AANP, 2007, para. 6).

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- **Primary care provider directed practice:** NP have been granted the legal right to prescribe medication in all 50 U.S. states and the District of Columbia. They can also have their own practice all over the U.S (AANP, 2007, para. 7).

Overall it looks like PCMH care model is very different from the current primary care practice. PCMH encourages the use of IT tools to not only provide a better patient care, but also make the care providing and coordinating process a smooth and streamlined for the medical professionals. Another constricting feature of PCMH over the traditional primary care is providing reimbursement for indirect patient care activities other than the face to face activities. Entrusting the primary care physician to be in charge of the care providing process and also lead the team of medical professional coordinate the care giving process. Thus PCMH aims to improve access, coordination and quality of primary care.

CHAPTER 3. RESEARCH PROBLEM

The PCMH model of care is relatively new and is being implemented in various healthcare systems and hospitals all across the United States in the form of pilot projects. However, there have been no research studies which help to understand the impact of PCMH implementation on the work practice and staffing level of nurses.

During the transition from a traditional model of care to the PCMH model of care, nurses are bound to come across some unseen challenges in addition to challenges which already exist in the primary care. The presence of these old and new challenges has lead to the formation of four primary hypotheses.

3.1. Research Hypothesis

The research hypotheses were proposed based on the analysis of current and past literature The primary hypotheses are related to the change in time spent by nurses performing clinical activities and changes in the staffing pattern of nursing in terms of Full Time Equivalent (FTE).The results obtained through the analysis of these hypotheses will help to identify changes and reach meaningful conclusions about work pattern and staffing level of nurses after PCMH implementation.

The following operational definitions were used for the listed nursing work task categories.

1) **Direct care:** "All activities involving direct interaction between the nurse and patient/family" Activities which are performed face to face in the presence of nurse and patient/family. (Williams et al., 2009, p. 2101)

2) **Indirect care non documentation:**

- *Medication administration:* Activities related to preparing, giving and evaluating the effectiveness of prescription and nonprescription drugs ("Medication Administration", 2012)

- *Unit Related Functions:* Activities which help in the normal functioning of the nursing unit/ward (Williams et al., 2009).

- *Care Coordination:* Care coordination involves a conscious effort to make available all the healthcare resources available to the patient and also coordinate the interaction between the patient and the type of healthcare resource being utilized by the patient. There should also be a reliable channel to exchange information between the resources providing care.("Care Coordination", 2012)

3) **Indirect care documentation:** The process which involves the description of care provided to the patient, current patient condition, "interventions" provided to the patient and the impact of these "interventions" on the health outcomes of the patient (Rehan,2010)

4) **Personal:** Activities which help the nurse to relax (Williams et al., 2009)

3.1.1. Hypothesis 1.

After PCMH implementation nurses will spend on an average more time on direct care than nurses before PCMH.

Rationale: According to Hendrich et al. 2008, direct patient care activity time accounts for less than 25% of total time spent by nurses during a typical shift, as compared

to more than 75% of the shift time spent on indirect care activities. Presently, there is a lack of direct patient activities that can help slow down the occurrence and side effects of an illness or disease (Adams et al., 2009). According to the principles of PCMH direct patient care should involve a team of medical professionals which includes the nurse and is headed by the primary care physician (Adams et al., 2009). This team of medical professionals is not just involved in providing occasional care to the patient, but has to perform some additional responsibilities of being the patients "confidant, coordinator and advisor" (Adams et al., 2009, p. 6).Thus in PCMH it is expected that there is going to be more time spent on direct patient care activities by nurses.

3.1.2. Hypothesis 2.

After PCMH implementation nurses will spend on average less time on indirect care non documentation (care coordination, medical administration, and nursing unit care) than nurses before PCMH implementation.

Rationale: According to Chaboyer et al. 2008, of the total clinical activities performed by nurses, almost 50% are indirect care activities. Administering wrong medication to the patient can lead to nurses spending their time to rectify it (Hendrich et al., 2008). Inability to exchange the patient health information with all healthcare sources, results in valuable patient care time lost (Hendrich et al., 2008). Nurses also spend a substantial portion of their time handling unit related activities (Prescott et al., 1991). According to Adams et al. 2006, PCMH principles encourage the use of information technology (IT) to enhance the patient experience and provide quality care. Time spent on indirect care can be brought down by the use of information technology and applying new

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processes to make the exchange of patient information smooth (Prescott et al.,

1991).Applying IT can have a time long term impact on the amount of time saved doing

indirect care activities (Cox, Harsanyi, & Dean, 1987). Thus the use of IT in PCMH is

bound to bring down the non productive time spent by nurses and will also provide patients

with a better care experience.

3.1.3. Hypothesis 3.

After PCMH implementation nurses will spend on average less time doing

documentation than nurses before PCMH implementation.

Rationale: Hendrich et al. (2008) claim that there is duplication of documents that

make the documentation process incompetent. Gabr (2010) states that computerized

nursing documentation is expected to reduce the duplication effort. Gabr's (2010) study

shows decrease in documentation time after the application of Electronic Healthcare

Records (HER). Use of "registries, IT, and health information exchange" (AAFP et al.,

2007, p. 3) can bring down the time spent on documentation. Mowry and Korpman (1987)

estimate that one-half hours per nursing service employee per shift could be saved by using

appropriate IT. From the above statements it is clear that, in traditional primary care use of

HER and other IT tools have brought about a positive change in the documentation process.

PCMH encourages the use of these new IT tools and we can expect the same efficiency in

the PCMH documentation process as in the traditional primary care set up.

3.1.4. Hypothesis 4.

Overall total Full Time Equivalent (FTE) for nurses after PCMH implementation will be greater than the Full Time Equivalent (FTE) for nurses before PCMH implementation.

Rationale: As stated earlier in the section 3.3.1, nurses in PCMH are going to have more responsibilities on their shoulders in addition to the already present in the current primary care set up. These added responsibilities will give rise to some new tasks being performed in the process of providing care to patients. Also if there is an increase in the number of patients after implementation of PCMH it is going to put an additional strain to provide quality care to all the patients. Thus the added responsibility of new tasks and a strong possibility of increase in the number of patients will eventually lead to increase in the nursing work force in terms of FTE.

CHAPTER 4. METHODOLOGY

The present study was designed to measure the influence of PCMH implementation on nursing practice. The following sections present the study methodology, description of the study design and the questionnaire development.

4.1. Study Design

The Patient Centered Primary Care Collaborative (PCPCC), a coalition of healthcare organizations and professionals which supporting the PCMH was used as the source of contacting the probable participants of this survey. The probable participants were contacted through email regarding the voluntary participation in the survey. A total of 14 participants agreed to participate in this online survey. The participants were mainly nursing professionals managing the department where PCMH has been implemented. The IRB office at NDSU stated that this study does not require any IRB certification or approval as the study does not fit the regulatory definition of research involving human subjects. The Group Decision Center at NDSU helped in preparing the online survey.

4.2. Questionnaire Development

A six page questionnaire was developed to measure the influence of PCMH implementation on nurse work practice in primary care. The screen shots of the online survey can be found in Appendix C. Since the questionnaire had a target population of individuals with busy work schedules, its length was kept to a minimum, so that more individuals would respond to the survey and at the same time its usefulness and dependability would be maintained of the survey. The questionnaire consisted of 5 sections:

1. Demographic questions

2. Nurse staffing level questions

3. Nurse work practice questions

4. Department operational questions

5. Comments about PCMH

4.2.1. Demographic questions.

This section consisted questions related to the demographics of the volunteered department. The types of department were selected based on the Patient Centered Primary Care Collaborative (PCPCC), Proof in Practice: A compilation of patient centered medical home pilot and demonstration projects, 2009 report. The majority of departments involved in providing primary care in the PCMH pilot and demonstration projects were:

- **Internal Medicine:** The branch of medicine involved in the treatment of diseases where surgery is not necessary (The glossary of Managed care Terminology, Pam Pholy Associates, 2009). It involves "prevention, diagnosis, and care of adults with general illness, disease, and injury" ("Internal Medicine", 2012).

- **Family Practice:** The branch of medicine involved in diagnosis and treatment of diseases for all the members of the family ("Family Practice" 2012)

- **Pediatrics:** The specialty branch of medicine involved in providing care and disease treatment to children ("Internal Medicine", 2012).

The demographic questions were helpful in understanding the job title of the survey taker, type of department, size of the department, number of patient visits, duration of PCMH implementation, implementation level of PCMH and type of PCMH certification.

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The data collected in the demographic section can be seen in Appendix A. As per the

Patient Centered Primary Care Collaborative (PCPCC), Proof in Practice: A compilation of

patient centered medical home pilot and demonstration projects, 2009 report all the

participants had a NCQA-PCMH certification. National Committee for Quality Assurance

(NCQA) is a not for profit organization which set up standards to measure the

implementation of PCMH.

4.2.2. Nurse staffing level questions.

The purpose of this section was to estimate any change in the size of the staffing

level of nursing staff after implementing PCMH. The unit used to measure the staffing

level was Full Time Equivalent (FTE). An FTE is a unit of measurement that represents

one person who works a full time position. One FTE can be filed by more than one person.

Part-time employees will work less than one FTE. 1 FTE = 40 hours/week x 52 weeks/year

=2080 hours/year. The survey takers were asked to mention the change in the FTE for

different types of nurses prior to and after PCMH implementation. They were also asked to

measure the expected change in demand of different type of nurses due to PCMH

implementation on a scale of 1-5. The data collected for the expected change was not in

terms of FTE.

4.2.3. Nurse work practice questions.

This section included questions related to the percent of time spent by nurses

performing clinical activities both prior and post implementation of PCMH. The following

operational definitions were used for the listed nursing work task categories.

1) **Direct care:** "All activities involving direct interaction between the nurse and patient/family" Activities which are performed face to face in the presence of nurse and patient/family. (Williams et al., 2009, p. 2101)

2) **Indirect care non documentation:**

   - *Medication administration:* Activities related to preparing, giving and evaluating the effectiveness of prescription and nonprescription drugs ("Medication Administration", 2012)

   - *Unit Related Functions:* Activities which help in the normal functioning of the nursing unit/ward (Williams et al., 2009).

   - *Care Coordination:* Care coordination involves a conscious effort to make available all the healthcare resources available to the patient and also coordinate the interaction between the patient and the type of healthcare resource being utilized by the patient. There should also be a reliable channel to exchange information between the resources providing care.("Care Coordination", 2012)

3) **Indirect care documentation:** The process which involves the description of care provided to the patient, current patient condition, "interventions" provided to the patient and the impact of these "interventions" on the health outcomes of the patient (Rehan,2010)

4) **Personal:** Activities which help the nurse to relax (Williams et al., 2009)

4.2.4. Department operational questions.

The purpose of this section of the questionnaire is to find out the impact of PCMH implementation on some of the operational parameters of the department. The respondents were asked to measure the change on a scale of 1-5.The operational parameters include:

- **Patient readmission:** "Subsequent admissions of a patient to the hospital or other healthcare institution for treatment." ("Patient Readmission", 2012)

- **Overall health of patients served by the department:** The improvement in the disease symptoms through the care provided by the medical professionals.

- **Patient satisfaction:** "Patient satisfaction is a measurement designed to obtain reports or ratings from patients about services received from an organization, hospital, physician or health care provider." ("Patient Satisfaction", 2012)

- **Job satisfaction:** Job satisfaction the sense of being content with his/her work

- **Overall department productivity:** The efficient utilization of all the department resources and care processes which contribute to the improved patient satisfaction and overall health, and job satisfaction for medical professionals.

4.2.5 Comments about PCMH

The purpose of this section is to get additional thoughts of the respondents about the influence of PCMH on nursing work behavior and job pattern. The respondents were also asked to provide additional comments if any about the PCMH implementation. The comments can be seen in the Appendix B.

CHAPTER 5. RESULTS AND DISCUSSION

The following section contains the result and discussion about the hypotheses developed in the previous section. It also contains the results and discussions of the data obtained from the online questionnaire.

5.1. Hypothesis Testing

In the following section the testing of the hypotheses presented in the Section 3.1 will be discussed. The hypotheses are very important part of this study and thus will be investigated in detail.

5.1.1. Hypothesis 1.

After PCMH implementation nurses will spend on an average more time on direct care than nurses before PCMH implementation.

The above hypothesis was proposed to determine if nurses spend on an average a greater amount of time on direct patient care after PCMH implementation than the nurses before. A total of 12 observations were recorded from the online survey. The average amount of time spent on direct care by nurses after PCMH implementation and before PCMH implementation can be seen in Table 2. There was a response of 40% by respondent No. 6 in Table 2 for time spent on direct care after PCMH implementation for any other type of nurse during a typical day shift. The descriptive test statistics can be seen in Table 3.

The results given in Table 3 reveal that there is no significant difference at an alpha level of .05 between the percentages of time spent on direct care by nurses after PCMH compared to nurses before PCMH implementation. Thus it cannot be concluded that nurses

spend more time on direct care after PCMH implementation than nurses before PCMH

implementation. In fact it appears that nurses are spending more time on direct care before

PCMH implementation.

Table 2

Average Time (%) Spent by Nurses on Direct Care During a Typical Day Shift.

Time Spent by Nurses on Direct Care During a Typical Day Shift (%)									
After PCMH implementation					Before PCMH implementation				
NP	RN	LPN	MA	Avg	NP	RN	LPN	MA	Avg
75	-	50	50	58.33	75	-	60	60	65
78	55	55	55	60.75	78	78	78	78	78
75	5	70	80	57.5	65	-	60	90	71.66
-	5	70	80	51.66	-	-	60	90	75
-	5	70	80	51.66	-	-	60	90	75
-	15	-	65	40	-	-	-	50	50
-	-	-	70	70	-	-	-	60	60
-	-	50	55	52.5	-	-	40	35	37.5
100	62.5	62.5	-	75	100	62.5	62.5	-	75
65	10	60	60	48.75	70	15	70	70	56.25
90	80	80	80	82.5	90	-	-	80	85
60	-	75	75	70	60	-	75	75	70
Mean	77.57	29.68	64.25	68.18	59.9	76.85	51.83	62.83	70.72	66.5
Std Dev	13.77	30.89	10.41	11.67	12.3	14.05	32.82	11.08	17.91	13.5

Table 3

Hypothesis Test to Determine if Nurses Spend More Time on Direct Care.

Time Spent on Direct Care by Nurses (%)				Difference	Null	Test Statistic	p-value
After PCMH Implementation		Before PCMH Implementation			$T_{(Direct\ Care\ after\ PCMH\ implementation)}$ $\leq T_{(Direct\ Care\ before\ PCMH\ implementation)}$	-1.26	0.890
Mean	59.9	Mean	66.5	-6.65			
SD	12.3	SD	13.5				
N	12	N	12				

This result is very surprising because the rationale for this hypothesis stated that nurses would have some added responsibilities in PCMH which would result in an increase in the time spent on direct care.

5.1.2. Hypothesis 2.

After PCMH implementation nurses will spend on average less time on indirect care non documentation (care coordination, medical administration, and nursing unit care) than nurses before PCMH implementation.

The above hypothesis was proposed to determine if nurses spend on an average a less amount of time on indirect patient care in after PCMH implementation than the nurses before PCMH implementation. A total of 10 observations were recorded from the online survey. The average amount of time spent on indirect care by nurses after PCMH implementation and before PCMH after can be seen in Table 4. The descriptive test statistics can be seen in Table 5.

The results given in Table 5 reveal that there is no significant difference at an alpha level of .05 between the percentages of time spent on indirect care by nurses in after PCMH implementation compared to nurses before PCMH implementation. Thus it cannot be concluded that nurses spend less time on indirect care after PCMH implementation than nurses before PCMH implementation. At the first look it appears nurses spend less time on indirect care after PCMH implementation. But statistically speaking it appears that nurses are spending slightly more time on indirect care before PCMH implementation. Neither IT nor the application of new processes were sufficient to bring down the indirect care time. As mentioned in the rationale of the hypothesis in section 3.1.2 the inefficiencies present in

handling the nursing unit and errors in medical administration could have contributed to

this result.

Table 4

Average Time (%) Spent by Nurses on Indirect Care Non Documentation During a Typical

Day Shift.

| | Time Spent by Nurses on Indirect Care Non Documentation During a Typical Day Shift (%) | | | | | | | | |
| | After PCMH Implementation | | | | | Before PCMH Implementation | | | |
	NP	RN	LPN	MA	Avg	RN	LPN	MA	Avg
	15	-	20	20	18.33	-	30	30	25
	11	33	33	33	27.5	11	11	11	13.75
	10	10	20	10	12.5	-	10	-	15
	10	10	20	10	12.5	-	10	-	15
	10	10	20	10	12.5	-	10	-	15
	-	30	-	20	25	-	-	30	30
	-	-	-	10	10	-	-	20	20
	-	-	10	10	10	-	30	30	30
	5	60	15	15	23.75	55	10	10	20
	15	-	10	10	11.66	-	10	10	11.66
Mean	10.85	25.5	18.5	14.8	16.37	33	15.12	20.14	19.54
Std Dev	3.43	19.93	7.32	7.62	6.71	31.11	9.18	9.83	6.72

Table 5

Hypothesis Test to Determine if Nurses Spend Less Time on Indirect Care Non

Documentation in PCMH.

| Time Spent on Indirect Care Non Documentation by Nurses (%) | | | | Difference | Null | Test Statistic | p-value |
After PCMH Implementation		Before PCMH Implementation			$T_{(\text{Indirect Care Non Documentation after PCMH implementation})} \geq T_{(\text{Indirect Care Non Documentation before PCMH implementation})}$		
Mean	16.37	Mean	19.54	-3.17		-1.05	0.153
SD	6.71	SD	6.72				
N	10	N	10				

5.1.3. Hypothesis 3.

After PCMH implementation nurses will spend on average less time doing documentation than nurses before PCMH implementation.

The above hypothesis was proposed to determine if nurses spend on an average a less amount of time doing documentation after PCMH implementation than the nurses before PCMH implementation. A total of 12 observations were recorded from the online survey. The average amount of time spent on documentation by nurses after PCMH implementation and before PCMH implementation care can be seen in Table 6. There was a response of 10% by respondent No. 6 in Table 6 for time spent on direct care after PCMH implementation for any other type of nurse during a typical day shift. The descriptive test statistics can be seen in Table 7.

The results given in Table 7 reveal that there is no significant difference at an alpha level of 0.05 between the percentage of time spent on documentation by nurses after PCMH implementation compared to nurses before PCMH implementation. Thus it cannot be concluded that nurses spend less time doing documentation after PCMH implementation than nurses before PCMH implementation. As stated in the rationale of the hypothesis in section 3.1.3 nurses spending more time on documentation can be a result of duplication. Also it seems that the use of Electronic Health Records and computerization of all the documentation process has not yet resulted in any substantial time reduction.

Table 6

Average Time (%) Spent by Nurses Doing Documentation During a Typical Day Shift.

	Time spent by Nurses on Documentation during a typical day shift (%)								
	After PCMH Implementation					Before PCMH Implementation			
	NP	RN	LPN	MA	Avg	NP	RN	LPN	MA	Avg
	5	-	25	25	18.33	5	-	5	5	5
	11	11	11	11	11	22	11	11	11	13.75
	10	80	10	5	35	10	-	30	5	15
	10	80	10	5	35	10	-	30	5	15
	10	80	10	5	35	10	-	30	5	15
	-	50	-	10	23.33	-	-	-	15	15
	-	-	-	15	15	-	-	-	20	20
	-	-	35	30	32.5	-	-	25	30	27.5
	-	37.5	37.5	-	37.5	-	37.5	37.5	-	37.5
	25	25	20	20	22.5	20	25	15	15	18.75
	10	10	10	20	12.5	10	-	-	20	15
	20	-	10	10	13.33	20	-	10	10	13.33
Mean	12.62	46.68	17.85	14.18	24.2	13.37	24.5	21.5	12.81	17.57
Std Dev	6.50	30.50	11.01	8.56	10.2	6.30	13.25	11.41	8.14	8.13

Table 7

Hypothesis Test to Determine if Nurses Spend Less Time Doing Documentation in PCMH.

Time Spent on Indirect Care Documentation by Nurses (%)				Difference	Null	Test Statistic	p-value
After PCMH Implementation		Before PCMH Implementation			$T_{(Indirect\ Care\ Documentation\ after\ PCMH\ implementation)} \geq T_{(Indirect\ Care\ Documentation\ before\ PCMH\ implementation)}$		
Mean	24.2	Mean	17.57	6.68		1.77	0.954
SD	10.2	SD	8.13				
N	12	N	12				

5.1.4. Hypothesis 4

Overall total Full Time Equivalent (FTE) for nurses after PCMH implementation

will be greater than the Full Time Equivalent (FTE) for nurses before PCMH

implementation.

The above hypothesis was proposed to determine if there has been increase in nurse

FTE after PCMH implementation. A total of 11 observations were recorded from the online

survey. The total nurse FTE for the department after and before PCMH can be seen in

Table 8. The descriptive statistics can be seen in Table 9.

The results given in Table 9 reveal that there is no significant difference at

an alpha level of 0.05 between the total nurse FTE for department after PCMH

implementation compared to total nurse FTE for department before PCMH

implementation. Thus it cannot be concluded that the total FTE for nurses after PCMH

implementation is greater than FTE for nurses before PCMH implementation.

Table 8

 Nurse FTE for Department.

Total Nurse FTE for Department	
After PCMH Implementation	Before PCMH Implementation
4	4
18	20
15	10
15	14
19	8
6	5
8	7
1	0
25	22
24	21
14	14

Table 9

Hypothesis Test to Determine if Total Nurse FTE is Greater in PCMH.

Total Nurse FTE for Department				Difference	Null	Test Statistic	p-value
After PCMH		Before PCMH			Total Nurse FTE$_{\text{(After PCMH)}} \geq$Total Nurse FTE $_{\text{(Before PCMH)}}$		
Mean	13.55	Mean	11.36	-3.48		0.67	0.257
SD	7.94	SD	7.42				
N	11	N	11				

5.2. Department Operational Parameters Data

The following section contains responses received for the department operational parameters. Please refer to the department operational questions section of the questionnaire in Appendix B. In the following section from 5.2.1 to 5.2.5 Figure 1-5, X axis represents the measuring scale and Y axis represents the number of responses.

5.2.1. Patient readmission.

A total of 12 responses were received for this question. The following Figure 1. lists the responses received for patient readmission. Out of the 12 responses, 9 got a response of decrease in patient readmission after PCMH implementation, 2 responses for no change and only 1 response for increase in patient readmission after PCMH implementation. It was necessary to know the change if any PCMH would have on the patient readmission, as PCMH is a new model of care providing very comprehensive and complete care to patients.

5.2.2. Overall health of patients.

All the 12 responses in this case responded to an increase in overall health of patients. The following Figure 2 lists the responses received for the overall health of

31

patients. The overall health of patients is the measure of success of the current care delivery

process and in this case the care delivery process is through PCMH.
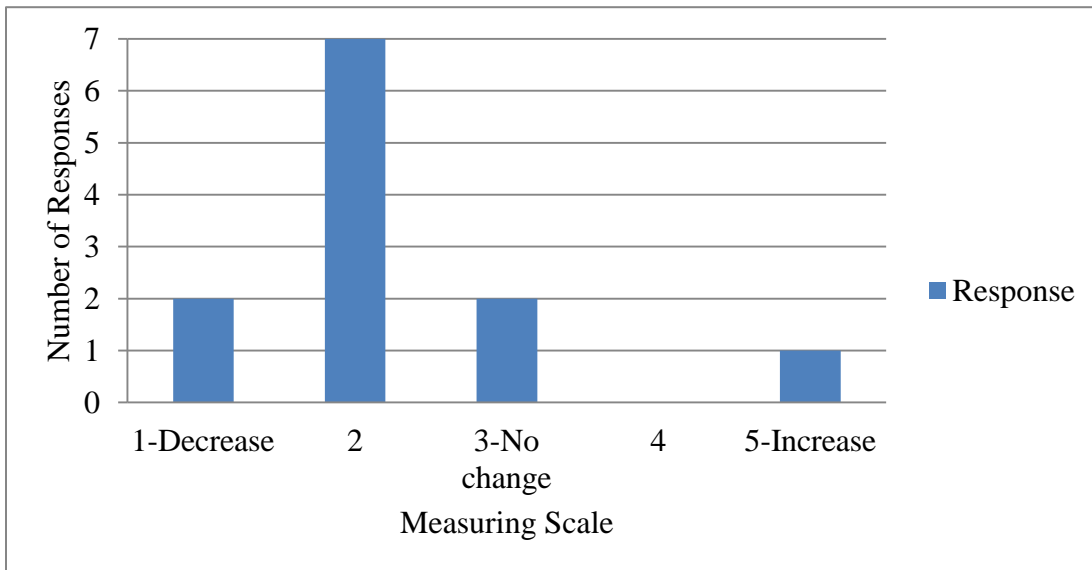
Figure 1. Data for Patient Readmission.
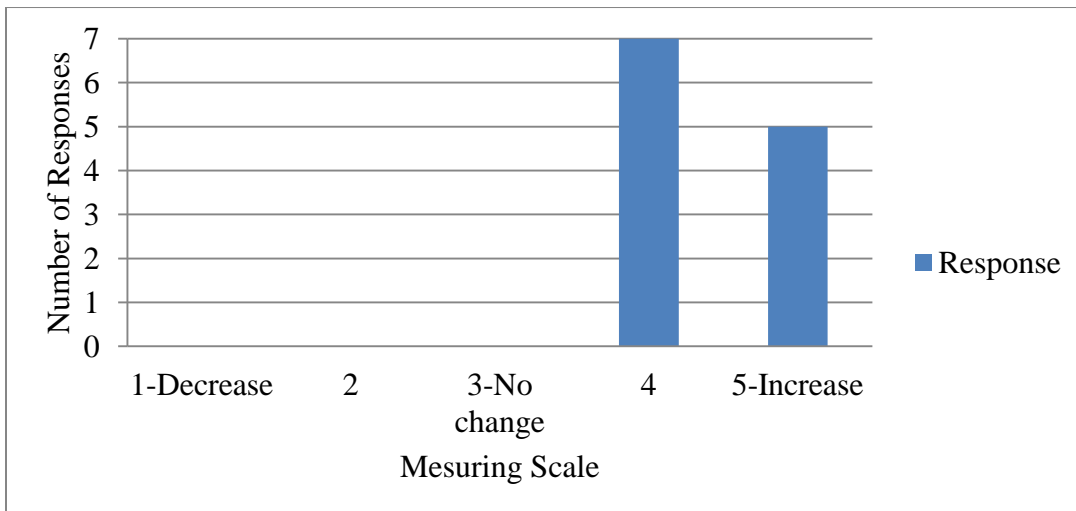
Figure 2. Data for the Overall Health of Patients.

5.2.3. Patient satisfaction.

According to the data in Figure 3 out of the 12 responses, 10 received a response of increase in patient satisfaction after PCMH implementation and 2 responses for no change in patient satisfaction. Measuring patient satisfaction helps the care providing entity to know the satisfaction the service provided to the patients. The service provided in this case is through the PCMH approach.
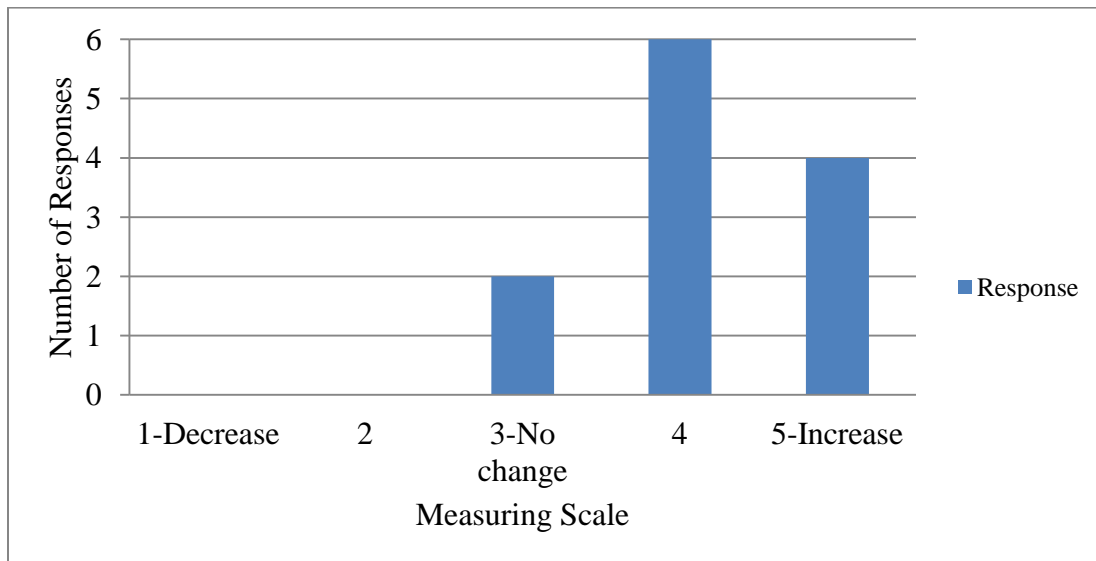
Figure 3. Data for Patient Satisfaction.

5.2.4. Job satisfaction of nurses.

According to the Figure 4 a total of 12 responses were received. The response to this question was very mixed. Even though there are 6 responses with an increase in job satisfaction after PCMH implementation; at the same time there are 4 responses for no change in job satisfaction and 2 responses for a decrease in job satisfaction after PCMH implementation.

The job of nurses is to provide care to patients through specific clinical tasks. Nurses utilize their experience and skills in carrying out the specific clinical tasks. It is important to measure the satisfaction nurses get from the clinical tasks they perform, because the ultimate goal is to provide the best possible care to patients.
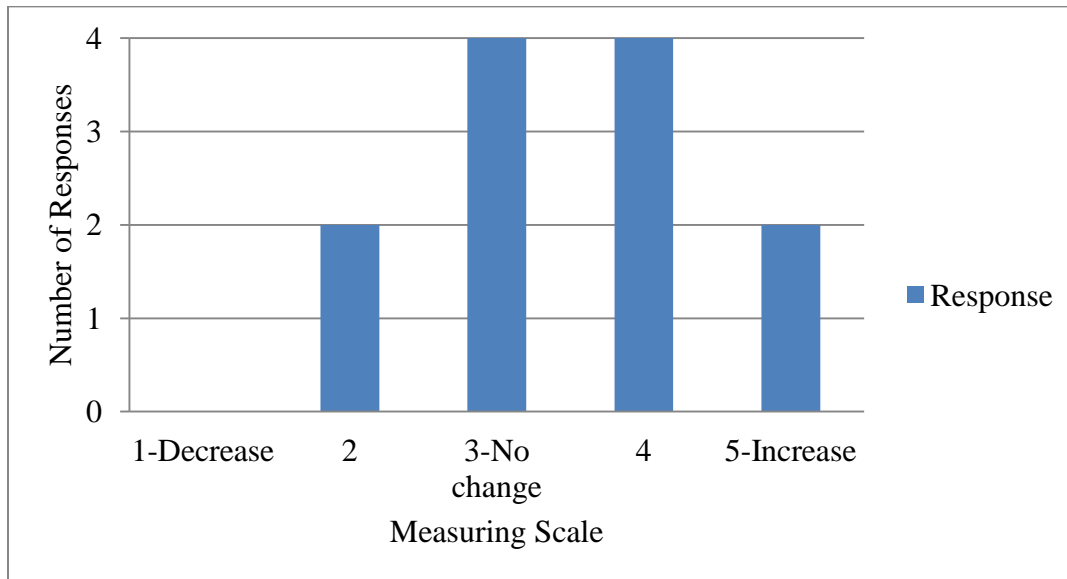
Figure 4. Data for Job Satisfaction of Nurses.

5.2.5. Overall department productivity.

According to the Figure 5 a total of 12 responses were received. The overall department productivity after PCMH implementation increased in case of 10 responses and remained the same for 2 responses. Measuring the overall department productivity helps to make visible the efficiency of the care providing entity. The efficiency comes from the proper utilization of the resources at hand and satisfaction of patients and the care nurses.

5.3. Nurse Staffing Level Demand Data

The following section contains responses received for the expected change in future nurse staffing demand (not in terms of FTE) after implementation of PCMH. Please refer to the nurse staffing level questions section of the questionnaire in Appendix B. The data in
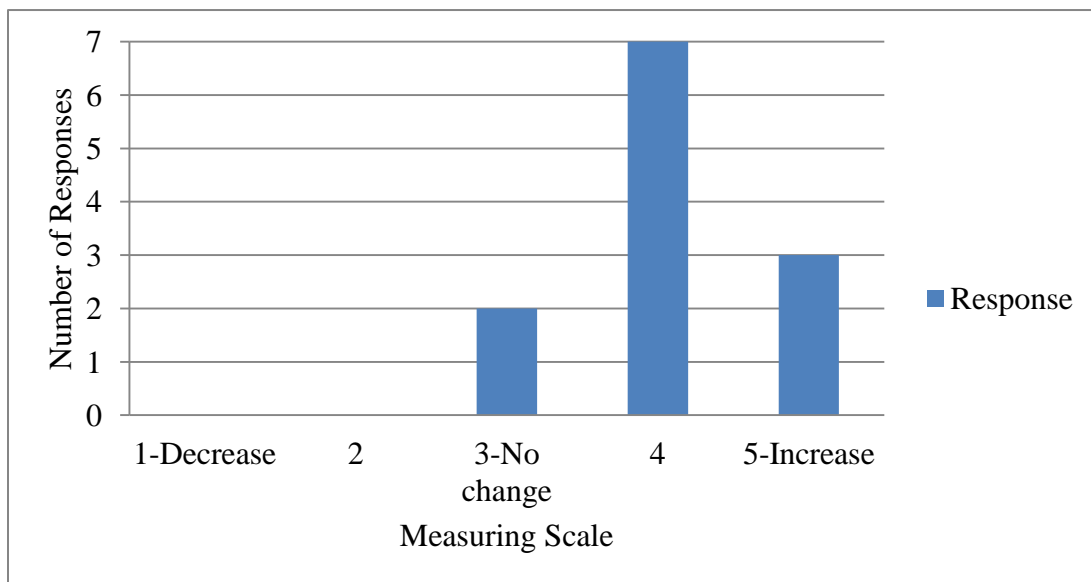
Figure 5. Data for Overall Department Productivity.

this section has the combined responses for all nurse types and the responses for individual nurse type. This section also contains data about the change in FTE of different type of nurses before and after PCMH implementation. In the following section from 5.3.1 to 5.3.6 Figure 6 to 11 the X axis represents the measuring scale and Y axis represents the number of responses.

The data collected about the combined change in demand for all nurse types and individual type of nurses will be help the healthcare organizations plan accordingly. On the other hand the data about the nurse FTE of different types tells us the current and past FTE demand for nurses.

5.3.1. Overall nurse demand.

From the Figure 6 it can be seen that a total of 49 responses were received. The responses for no change and increase in demand got the same number of responses, of 22.There was only 1 response where the nursing demand was significantly low. In the Figure 10. The data in figure 10 is further analyzed (in Figure 11 to 15) to show the change in demand for specific nurse type.
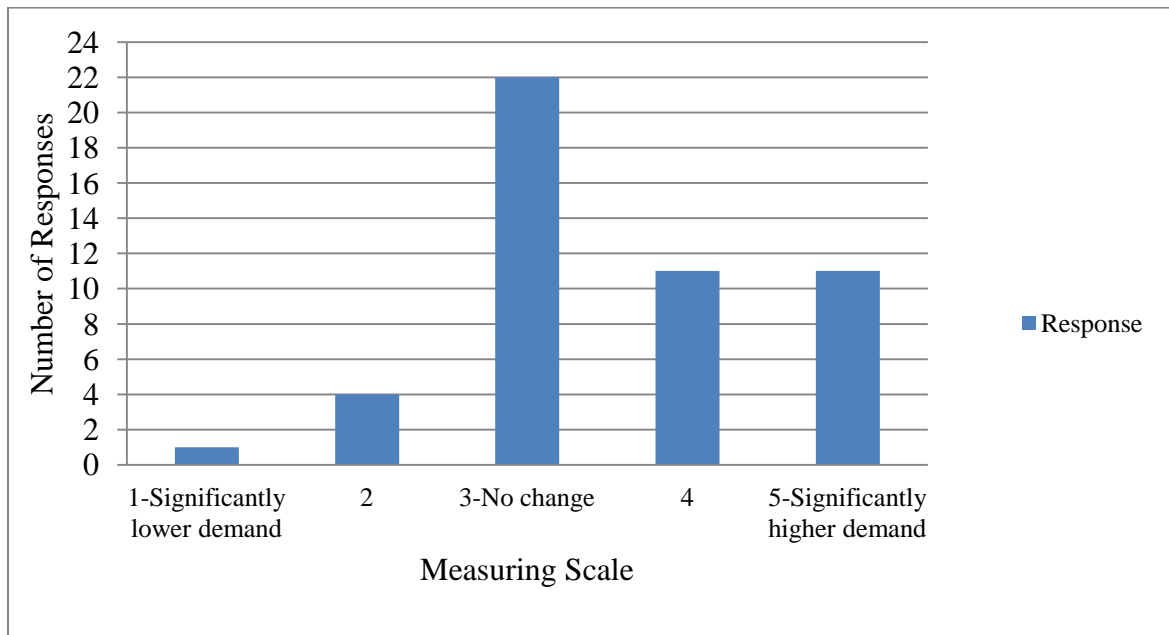
Figure 6. Data for Overall Nurse Demand.

5.3.2. NP demand.

Figure 7 shows a total of 12 responses to the specific category of NP demand. Out of those 12 there were 8 responses for no change and 3 responses for a significantly higher demand.

5.3.3. RN demand.

Figure 8 shows a total of 12 responses to the specific category of RN demand. Out of those 12 the maximum response of 9 was for the significantly higher demand option and 3 responses for no change in RN demand.
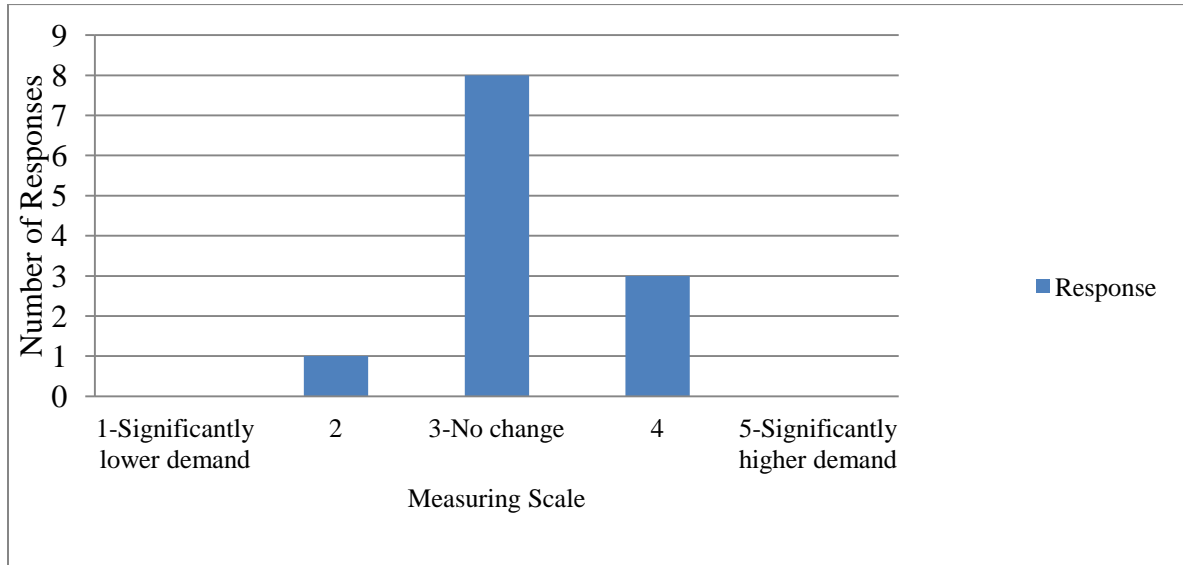
Figure 7. Data for NP Demand.
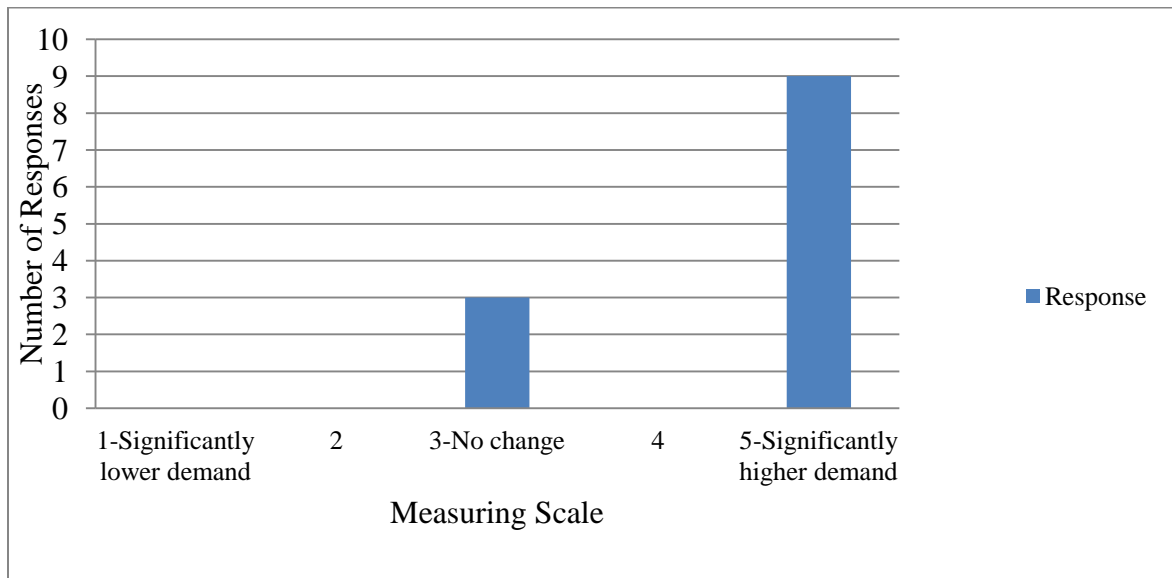
Figure 8. Data for RN Demand.

5.3.4. LPN demand.

Figure 9 shows a total of 12 responses to the specific category of LPN demand. Out of those 12 there were 6 responses for no change and an equal number of responses for an increase in LPN demand after PCMH implementation.
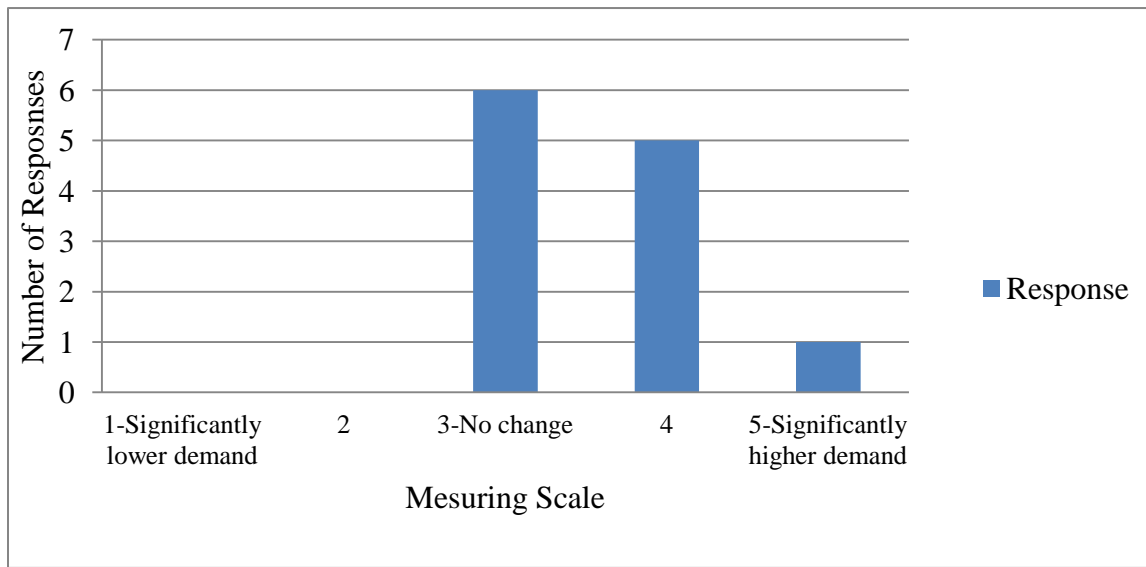
Figure 9. Data for LPN Demand.

5.3.5. MA demand.

Figure 10 shows a total of 12 responses to the specific category of MA demand. The change in MA demand after PCMH implementation got a very mixed response. There are 4 responses for no change, 4 responses for an increase and 3 responses for decrease in demand.

5.3.6. Other type of nurse demand.

From the figure 11 in case of the other type of nurse demand there is only 2 response of no change in demand.
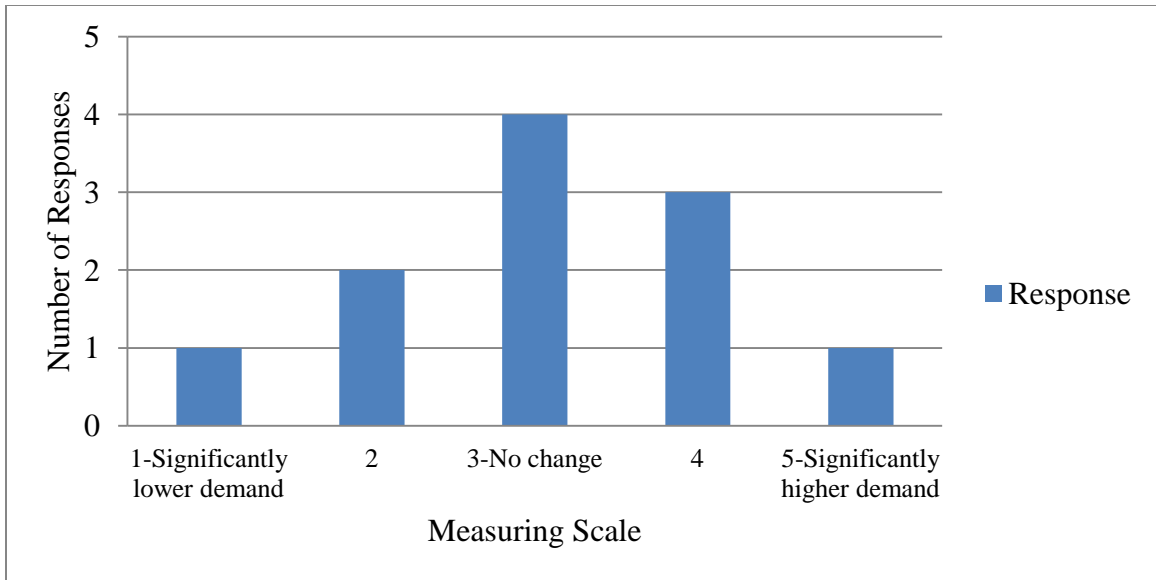
Figure 10. Data for MA Demand.
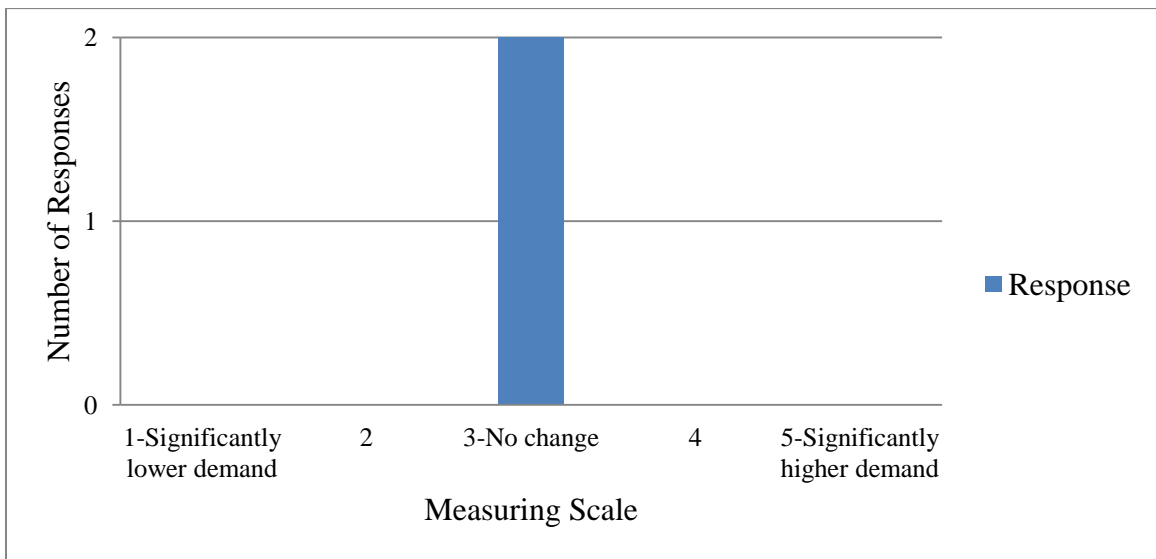
Figure 11. Data for Other Type of Nurse Demand.

5.4. FTE for different type of nurses.

The data from Table 9 titled Total Nurse FTE for department in section 5.1.4 was

used to generate the data mentioned in Table 10. The data in Table 10 shows the change in

FTE for different types of nurses after and before PCMH implementation. From the data in

Table 10 it becomes clear that the FTE have increased for NP and RN after PCMH. FTE

for LPN has remained the same after PCMH and there is a slight decrease in FTE of MA

after PCMH implementation. Total FTE after PCMH is greater than FTE before PCMH.

Table 10

Total FTE for Different Type of Nurses.

	FTE	
Type of Nurse	After PCMH Implementation	Before PCMH Implementation
NP	20	15
RN	26	6
LPN	48	48
MA	54	56
Other	1	0
Total FTE	149	125

5.5. Demographic Data

Figure A.4, Figure A.5, and Table A.2 in Appendix A, contains data related to the

implementation and certification of PCMH. The purpose behind collecting the data related

to PCMH implementation was that it can be put to use in future research. The data from

Figure A.1. in Appendix A about the type of departments states that there are 2 Internal

Medicine, 8 Family Practice and 1 Pediatric department that participated in the study.

5.6. Limitations of the Study

The questionnaire does not measure the quality of the nurse clinical activities. The

questionnaire does not measure the percentage of time spent on individual clinical activities

by nurses, rather it measures the percentage of time spent on different categories of nurse

clinical activities during a typical day shift. Questions in the survey lack some validity due

to the limited survey population, limited research activity about the involvement of nurses in PCMH, and limited resources.

Indeed these shortcomings were commented upon by some of the survey participants. One comment said "Our structure does not necessarily align with the way these questions are geared" (Appendix B, Q.19, and Comment No. 2). PCMH is being implemented in numerous sites all over the U.S. and it was not within the scope of the researcher due to limited resources and time restrictions to carry out a detailed analysis about the functioning of each PCMH implemented site.

The above discussed thought is also applicable to some more comments, "Some questions were difficult to complete", (Appendix B, Q.19, Comment No. 3) and "Many of these questions are difficult to measure as specifically related to PCMH because we have began implementing a few months and are implementing in phases" (Appendix B, Q.19, Comment No. 6). It can also be stated that along with the limitations the researcher had and the thoughts about small duration of implementation of PCMH, which proved difficult for the participants to answer the survey questions.

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

The following section contains the main conclusions of this study. Additionally, recommendations for further research are presented.

6.1. Conclusions

According to the hypothesis in section 3.1.1 nurses were expected to spend more time on direct care after PCMH implementation than nurses before PCMH implementation. Nurses in PCMH had to perform some additional tasks along with providing occasional care to patients (Adams et al., 2009) and also be a part of the team of medical professionals(Adams et al., 2009) which was expected to increase the time spent on direct care. But from the data analysis of this hypothesis it was found that this is not the case. Nurses spent less time providing direct care after PCMH implementation. It can be concluded that nurses in PCMH are providing appropriate care as per the PCMH principles with less time spent in doing the same.

Even though nurses spent less time on direct care in after PCMH implementation as compared to before PCMH implementation, there was no negative impact on the department operational parameters. As reported in the Department Operational Parameters Data (sections 5.2.1, 5.2.2, and 5.2.3) after PCMH implementation, there was a decrease in the patient readmissions. An increase in the overall health of patients and an increase in patient satisfaction. Thus it can be concluded that PCMH implementation has made nurses even more efficient, dedicated, and hard working towards providing direct care to patients.

According to the hypothesis stated in section 3.1.2, nurses were expected supposed to spend less time on indirect care after PCMH implementation. Even though it looks like

nurses do spend less time on indirect care after PCMH implementation, (see Table 5 in section 5.1.2) it becomes clear that statistically speaking nurses do not spend less time on indirect care after PCMH implementation. Nurses providing indirect care after PCMH implementation will need some time before they become expert in the use of IT, which is an important part of care coordination in PCMH. Thus it is to be expected that once the nurses begin handling the IT component more efficiently it will reduce the indirect care time. Also results seems to indicate that nurses spend more time than expected on handling unit related activities and rectifying errors occurring due to wrong medication administration.

Thus it can be said that inexperience in handing IT, inefficiency in handling unit related activities and errors due to wrong medication have contributed to the more time spent on indirect care after PCMH implementation by nurses. Some substantial steps like starting a "Clinic Efficiency Improvement Process", (Appendix B. Q.20, Comment No.1) and have a "Dedicated process improvement staff",(Appendix B. Q.20, Comment No.4) can bring more efficiency to the unit handing activities and medical administration and also provide appropriate training to the nursing professionals to handle the IT side.

The analysis of the hypotheses in section 3.1.3 shows that nurses still spend more time doing documentation after PCMH implementation than before PCMH implementation. It seems that the use of IT and health information exchange has little impact on the time spent on documentation in PCMH. Providing intensive training in handling various features of the new technology, trouble shooting any technical and

handling issues after implementation can help to make the use of technology by nurses less time consuming and more efficient.

The analysis of the hypothesis in section 3.1.4 shows that FTE for nurses after PCMH implementation is less as compared to FTE for nurses before PCMH implementation. But if one takes a look at the total nurse FTE for the department in Table 11, it is evident that after PCMH implementation there has been an increase in FTE from 125 FTE to 149 FTE. Thus it is the choice of the official in charge of the department to stick with the statistical results and believe no change in FTE after PCMH implementation or just go by the final total value of change in FTE of nurses. Whatever may be the choice of the person in charge it should be in the best interest of the department.

Table 11

Total Nurse FTE for Department.

Total Nurse FTE for Department	
After PCMH Implementation	Before PCMH Implementation
4	4
18	20
15	10
15	14
19	8
6	5
8	7
1	0
25	22
24	21
14	14
Total = 149	Total = 125

The data in Table 10 of section 5.4 also suggest an increase in total FTE of nurses after PCMH implementation. But the same cannot be said about FTE of all nurse types.

There is increase in FTE after PCMH implementation for RN, but a slight decrease for NP and MA FTE.LPN FTE has remained unchanged. Thus the change in FTE demand varies according to the nurse type.

The data present in the Table 10 of section 5.4 has the FTE values for different types of nurses after and before PCMH implementation. But the data in section 5.3.1-5.3.6 was a response to the question of change in the demand for different types of nurses in future. Thus according to the data from section 5.3.1-5.3.6 after PCMH implementation the overall demand of nurses is going to remain the same or there is going to be a significantly higher demand for nurses. But the demand data for each type of nurse indicated that then there is no change in the NP demand. RN demand either remains stable or a significantly increases. Similarly LPN demand also remains stable and any increase in demand will be less significant than the RN demand. The MA demand is very hard to predict because of the mixed nature of the data. A convincing conclusion cannot be reached to decide the nature of MA demand.

From the hypothesis result in Table 9 it can be said that there is no overall increase in FTE of nurses after PCMH implementation. The overall demand in future for overall nurses will remain same or significantly increase. Thus it seems that the department manager goes by the definition of FTE, where it says that 1 FTE can be filled by 1 or more than 1 person (nurse). But the data in Table 10 also suggests that there is not necessarily an increase in FTE for every type of nurse and the same can be said about the future demand of different nurse types (not in terms of FTE).

The data on job satisfaction of nurses after PCMH implementation in section 5.2.4. shows that 50% of the data suggests that there has been an increase in job satisfaction, 33% says there is no change and 16% says there in decrease in job satisfaction. From the data it can be concluded that PCMH has had an overall positive impact on the job satisfaction and also the nursing staff feels that "they are more valuable because they are practicing at the top of their license", (Appendix B, Q.20, and Comment No. 1) The overall department productivity has also increased according to the data in section 5.2.5.

As stated in one of the comments about PCMH in Appendix B, Q.20, Comment No. 1. " Overall, there is a sense of improvement in patient care and staff satisfaction". Thus from the above statement and data on operational parameters it can be stated that PCMH has been successful in enhancing the patient satisfaction about care received and also the job satisfaction of nurses in primary care. PCMH has also increased the access of patients (Figure A2 in Appendix A) and improved the overall health condition of patients in primary care. The staffing level for nurses is also bound to change after PCMH implementation.

It must be kept in mind that that this study is a ground breaking attempt to analyze the PCMH impact on nurses, so some of the results are surprising. Like the results of the hypothesis testing where it was expected that nurses be spending more time on direct care and less time on indirect care and documentation. The results will only get better with long duration of PCMH implementation. The results can be as expected if it is possible to "communicate clearly the changes and expectations to staff and allow time for training and retraining."(Appendix B, Q.20, Comment No.5). What's more, it is highly probable that as

more research is conducted which involves PCMH and the medical professionals, it is only going to make the primary care for both patients and the medical professionals involved a very satisfying experience.

6.2. Recommendations for Further Research

One of the comments states that "We felt like we had to breakdown the practice and rebuild the practice with new workflows. This is an ongoing process that changes on a daily basis." (Appendix B, Q.20, Comment No. 1) which suggests that PCMH holds a lot of potential to conduct meaningful and path breaking research.

The study was an early attempt to find the impact of PCMH implementation on nurse work practice and staffing levels. It is now know that even though PCMH is a relatively new model of care and it holds a lot of good potential to have a substantial impact on the U.S. healthcare system. This study could be used as a reference for future research which involves components like PCMH and nurses.

On the similar lines as this present study, a new study could be developed where one can study the impact of PCMH implementation on,

- Individual departments providing primary care like, Internal Medicine and Family Practice
- Change in work practice for each individual type of nurse.
- A combination of any particular department and type of nurse.

The implementation period and the implementation level data of PCMH in departments which participated in the survey can be seen in Appendix A, Figure A.3 and Figure A.4. This type of data can be used to see if the duration and implementation level of PCMH in

the department can affect the outcomes of the future research, because as stated in

Appendix B, Q.20, Comment No. 5, "It is a tedious process and requires time to implement

correctly to provide the most beneficial outcome for the patient".

Future research could also be done where the influence of PCMH implementation

on physicians in primary care. It would be interesting to study the impact PCMH could

have on the working culture of physicians. Since physicians play a very crucial role in

providing primary care to patients, such type of study can provide some crucial findings

which could go a long way in which primary care is practiced.

A comment from one of the survey participant states that "Funding is a huge part of

this implementation" (Appendix B, Q.20, Comment No. 1).Thus future studies could look

into the impact PCMH can have on the financial side of nursing practice and the whole

department. It would be of interest to find out the changes if any in various financial

parameters related to nursing practice of PCMH implemented departments.

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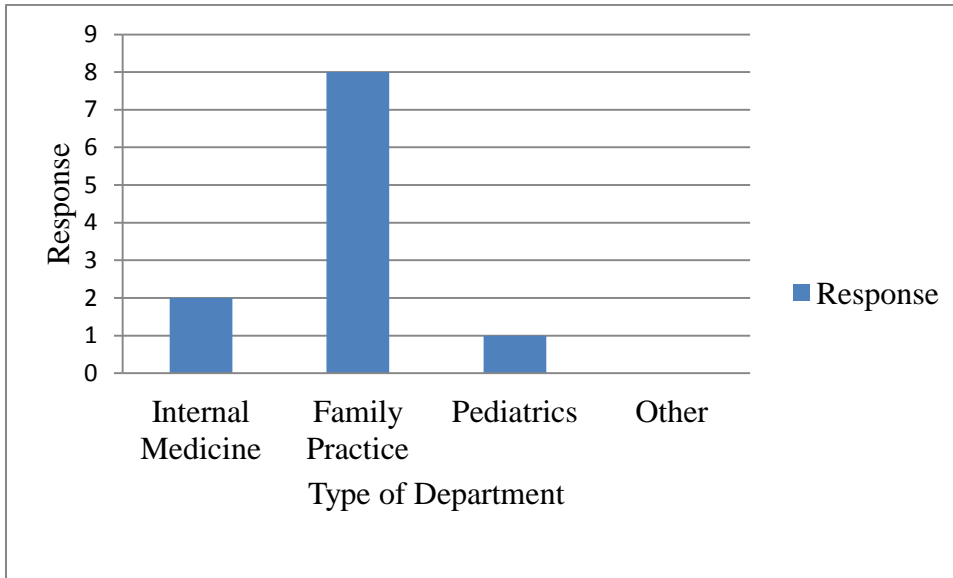
Figure A.1. Type of Department.
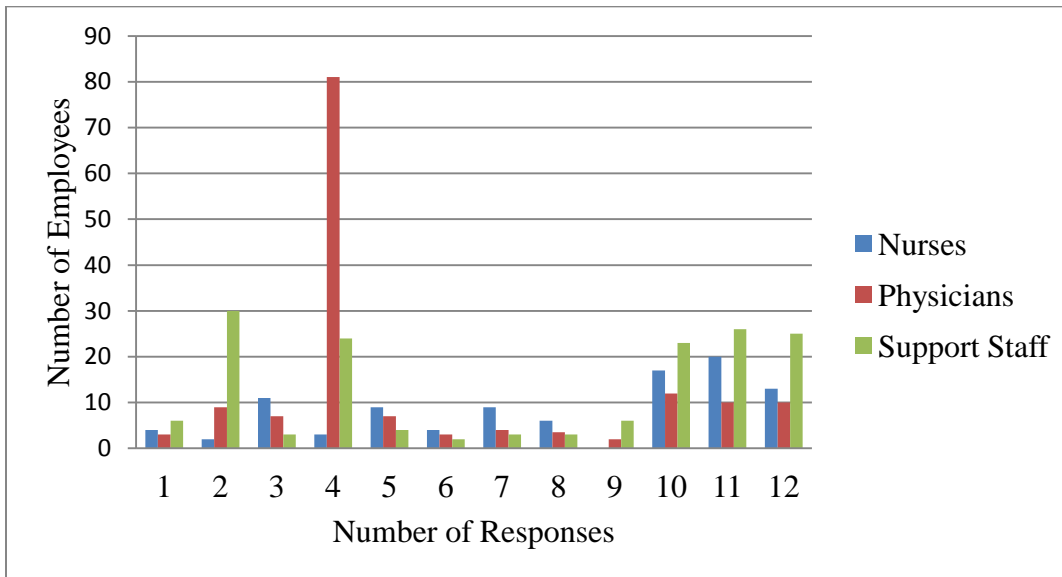
Figure A.2. Department Size.

Figure A.3. Number of Patient Visits Before and After PCMH Implementation.
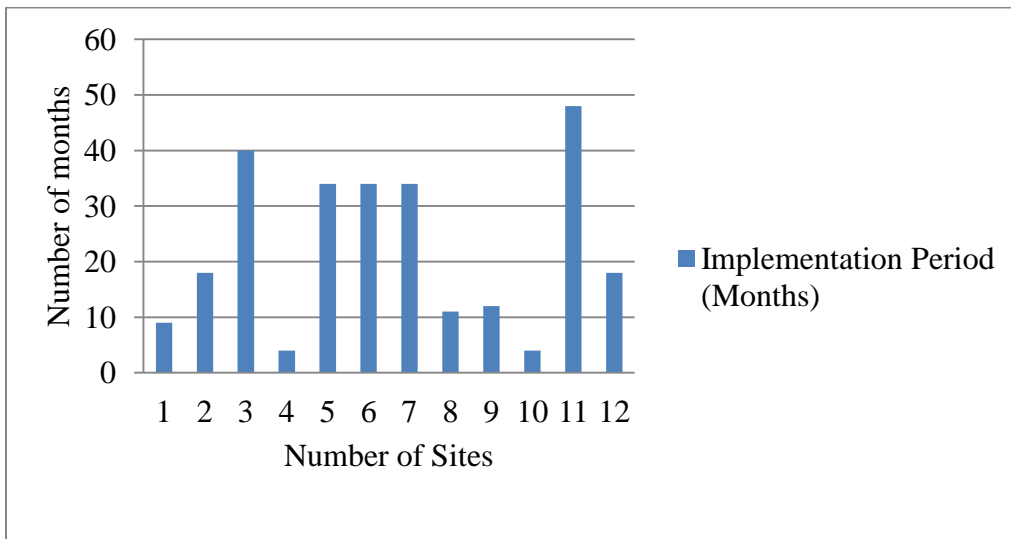
Figure A.4. PCMH Implementation Period (Months).
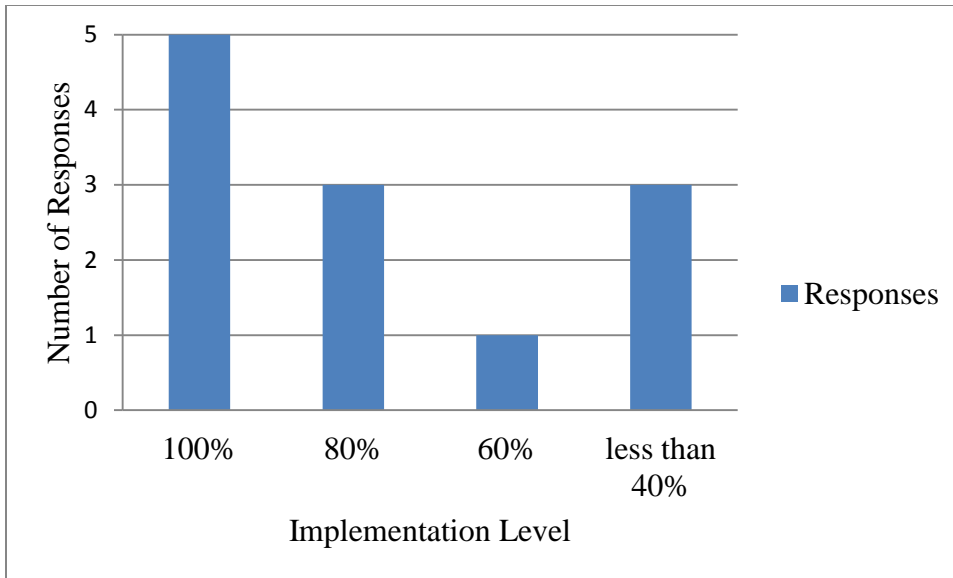
Figure A.5. PCMH Implementation Level.

Table A.1

Certification for PCMH.

Response for NCQA or any Other Certification
Achieved Level 3 NCQA Recognition
we are currently working on NCQA certification
yes, PCMH Level 3 with NCQA
Not in the process.
Not in the process
Not in the process
yes-Level 3
Achieved
Yes. Also, CPCi and Meaningful Use.
Yes, NCQA
We are in the process of achieving NCQA PCMH at all 3 of our sites. We are currently recognized by BC/BS of Michigan as a PCMH at all 3 sites.

APPENDIX B. COMMENTS FROM THE ONLINE SURVEY

Q.9 Did the size of department (e.g. Providers, type of nurses, supporting staff) change when PCMH was implemented?

1. No

2. Yes, during the implementation, we lost 2 mid level providers to a new Urgent care that opened in the same city block of the clinic. we have since added one Nurse practioner and one Physician assistant.

3. Yes, Change was need to expand and enhance how we provide service and to what level, which we decided to do, prior to deciding apply for Medical Home status.

4. No

5. Yes, Increase in patient load

6. Yes, Increase in patients

7. Yes, Patient load increase

8. Yes

9. No

10. Yes

11. Yes, We added care managers and a triage nurse function

12. No

Q 11. If nurse staffing level (FTE) changed, what other factors besides the PCMH implementation influenced the change?

1. The director of nursing was let go of her position but will be replaced once a qualified person is found.

2. Again it was our desire to enhance services, and part of this to was in the way we practice, and implementation of EMR, and changing from a traditional clinic model to a medical home model and shifting where some of the daily tasks are done, more on nursing then the traditional model which was more on providers.

3. Meaningful use requirements

4. meaningful use

5. meaningful use

6. Patient education

7. They did not change so far

Q.19 Please provide any additional thoughts on the influence of PCMH on nursing work behavior and job demands.

1. We currently use the nurse assistant and LPN in the same manner. There is usually one of each in every Doctor suite.

2. Our structure does not nessarily align with the way these questions are geared. we have one nurse per provider, a float nurse, 2 1/2 care cordinators, nurse triage, and a secretary, one clinic nurse manager, myself a nurse that also oversees and assists with clinic operations, and a secretary. Prior to changing our model we had one nurse per provider and that was all, plus eventually we had a nurse manager.

3. Some of these questions were difficult to complete. Our organization utilizes nurse practitioners as physicians. They see patients and act in a similar manner as our physicians.

4. I feel our medical assistants are able to function more closely and timely with patients since instituing a triage department to handle in coming calls and return calls to patients, plus handling the majority of the medication refills.

5. I think the PCMH expands opportunities for nursing across the continuum of care especially the ambulatory care setting.

6. Many of these are difficult to measure as specifically related to PCMH because we have only began implementing a few months and are implementing in phases. However, we did start a Clinic Efficiency Improvement Process that has closely aligned with many things PCMH has required. In order to do that, many of our staffing numbers and workflows did change significantly. There is a balance that must be struck between the face to face time required and the documentation necessary to meet the requirements. In some regards a decrease in face to face time is replaced by increased patient information/education (Clinical Visit Summaries) so a decrease in face time is not necessarily a negative as long as it continues to benefit the patient.

Q.20 Please feel free to provide any additional comments on key factors that influence successful implementation of PCMH.

1. Funding is a huge part of this implemenation. In order to be successful, there needs to be funding available to the care coordinator and the practice. In order to make changes that benefit the patients, it takes time and money. We felt like we had to breakdown the practice and rebuild the practice with new workflows. Everything from rooming a patient to follow up appointments have been looked at. This is an

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ongoing process that changes on a daily basis. The general consensus of the

nursing staff is that they feel like they are more valuable because they are practicing

at the top of their license. There is better communication between the staff over all

and everyone feels like they are better serving the patients. There is more freedom

for the nursing staff to order medications and labs due to the protocols that have

been created and agreed upon by the physicians. There is a smoother transition

from inpatient to home and follow up in the clinic. Over all, there is a sense of

improvement in patient care and staff satisfaction.

2. EMR

3. Set up a TRIAGE department!!!! It is a life saver!!!!

4. Dedicated process improvement staff and the ability to manage change and lead

adaptively.

5. Key factors are to communicate clearly the changes and expectations to staff and

allow time for training and retraining. It is a tedious process and requires time to

implement correctly to provide the most beneficial outcome for the patient.

APPENDIX C. SCREENSHOTS OF ONLINE SURVEY
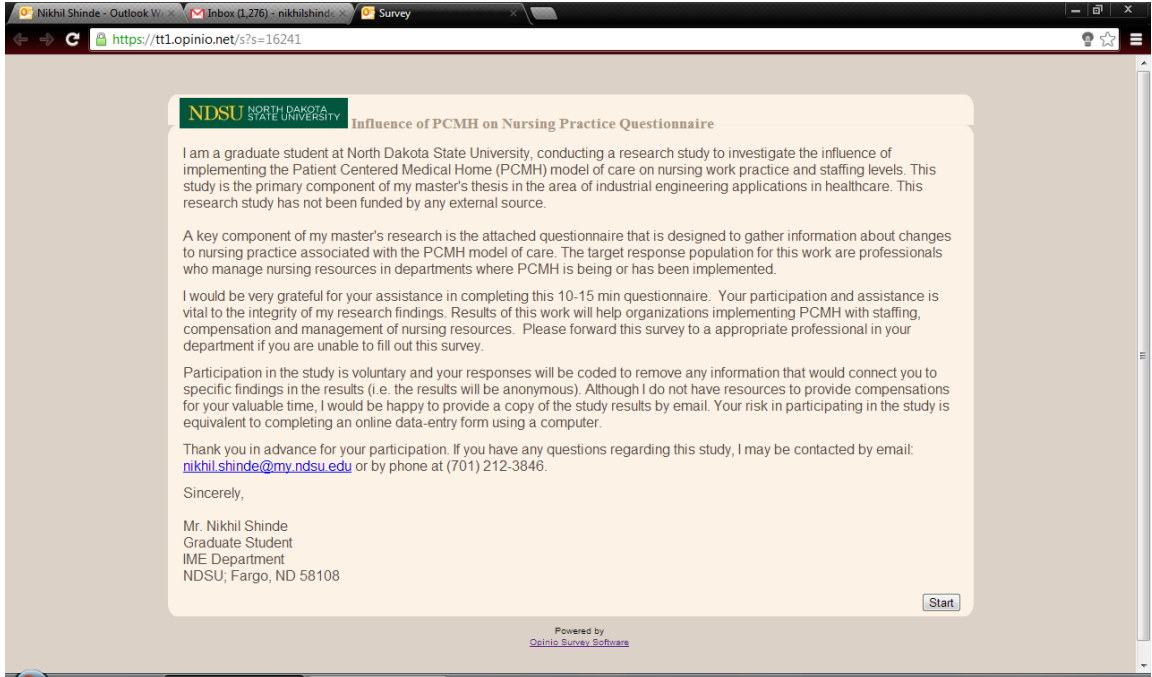
Figure C.1. Screenshot of Survey Letter.
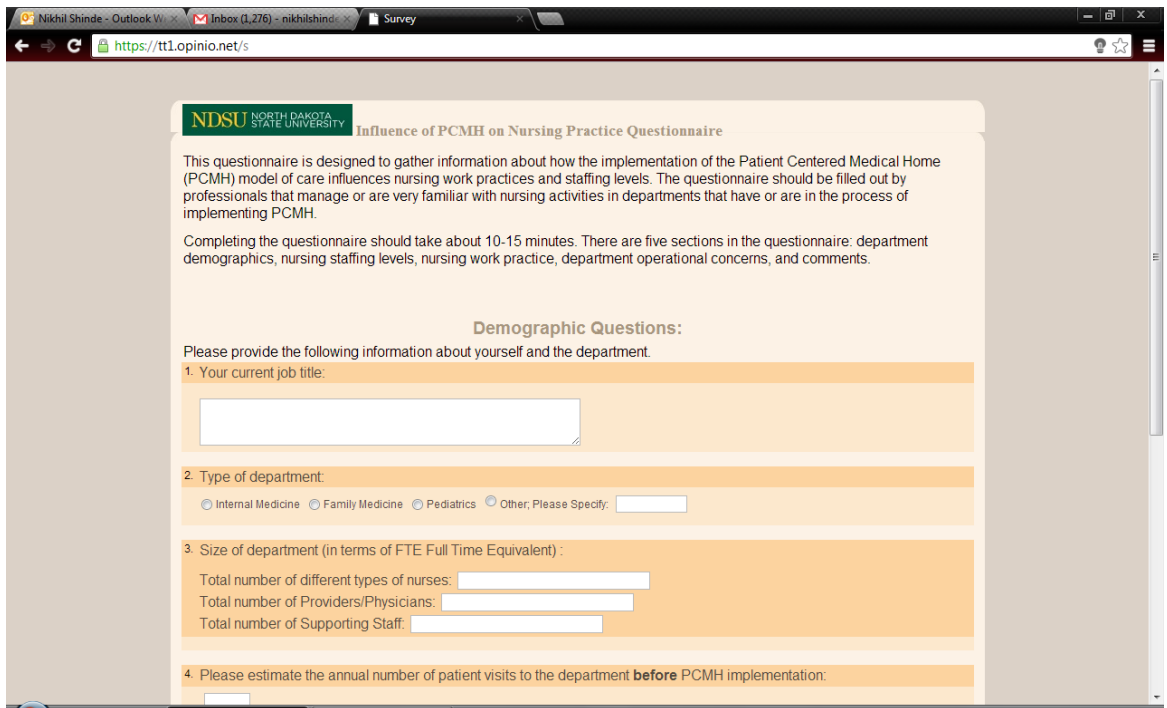
Figure C.2. Screenshot of Demographic Questions-1.
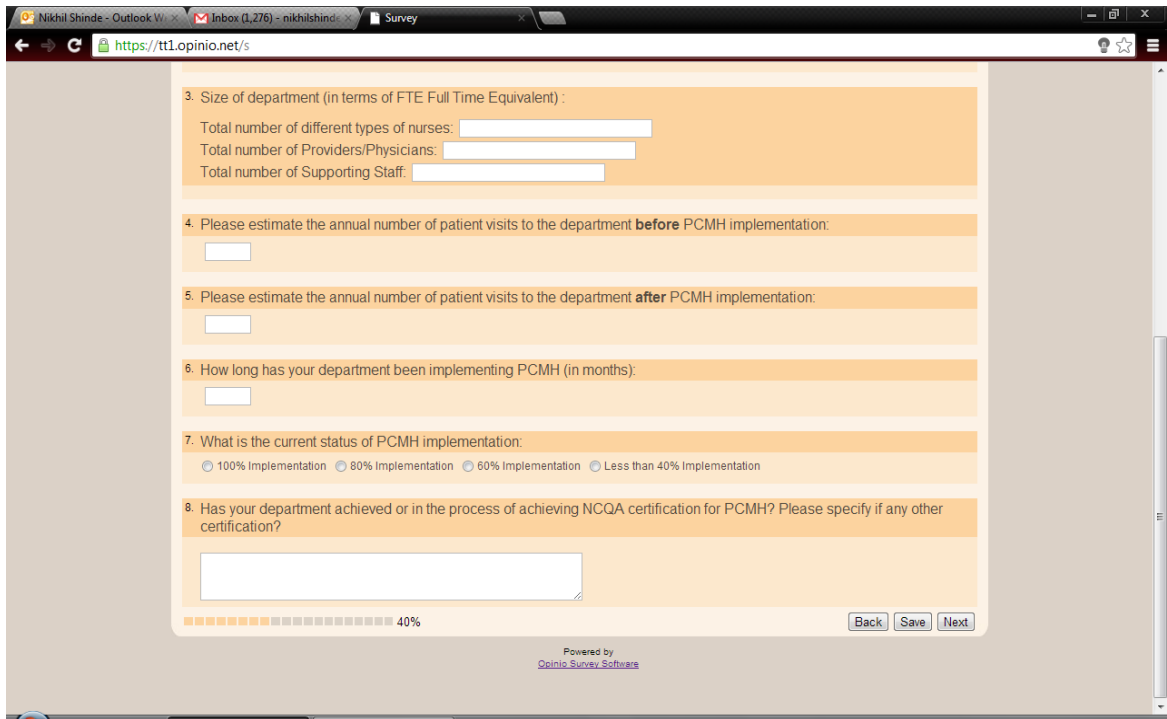
Figure C.3. Screenshot of Demographic Questions-2.
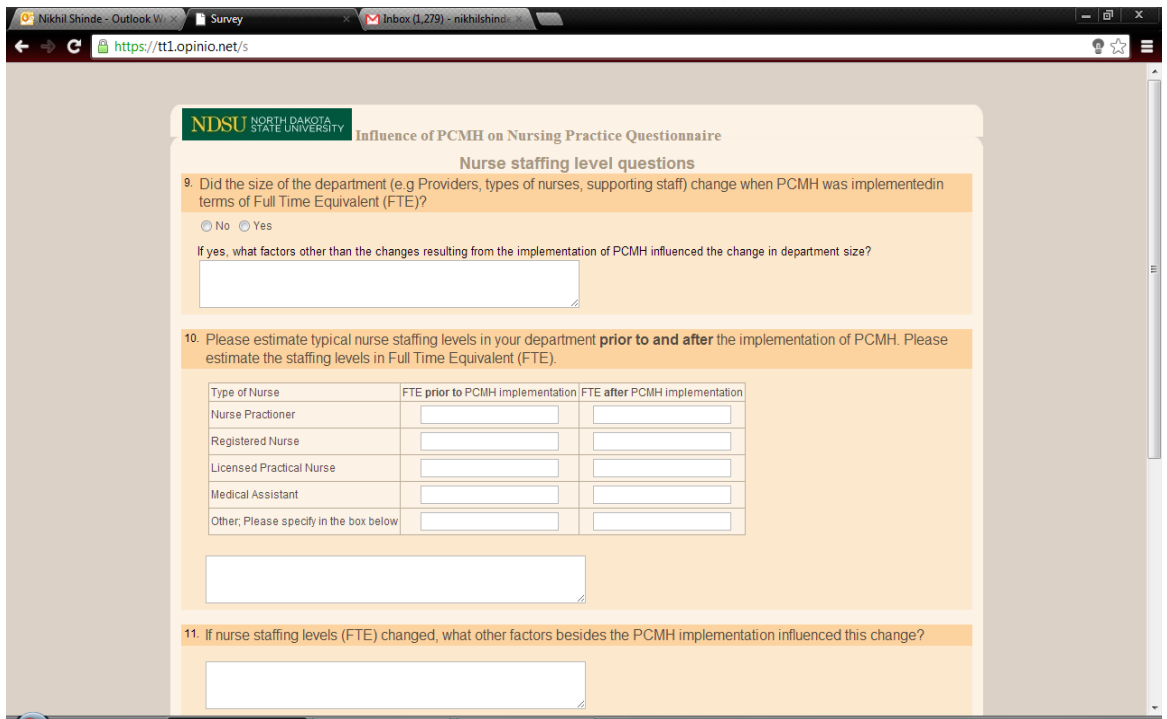
Figure C.4. Screenshot of Nursing Staffing Level Questions-1.
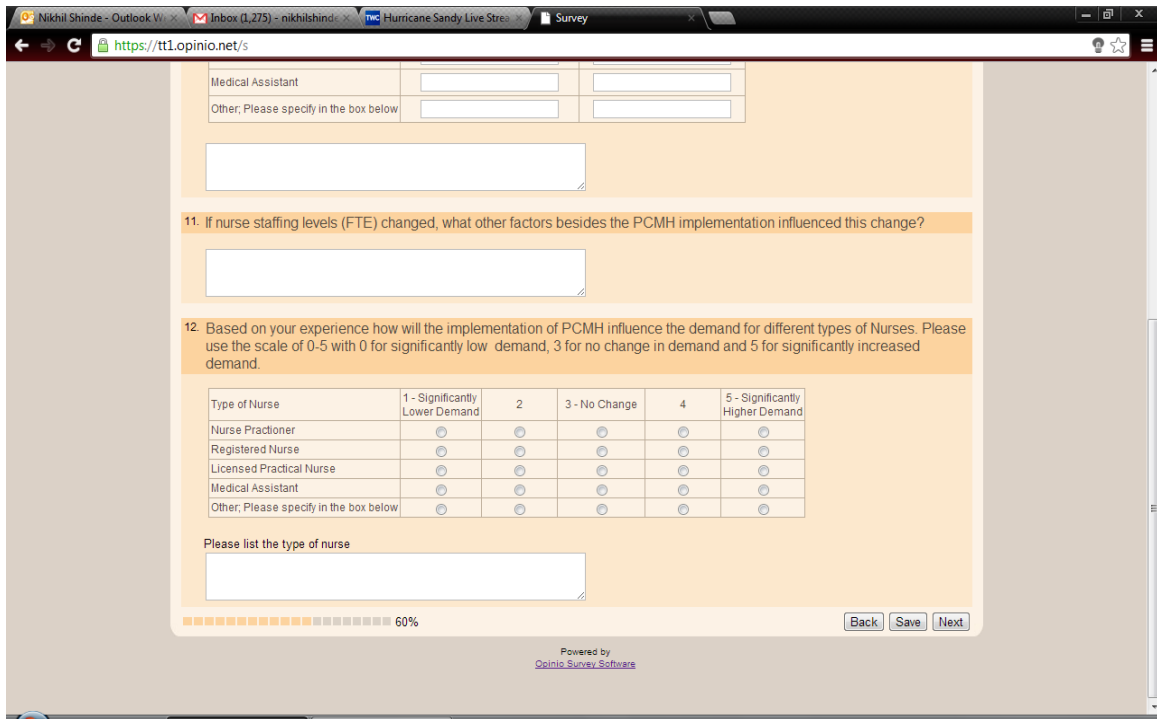
Figure C.5. Screenshot of Nursing Staffing Level Questions-2.
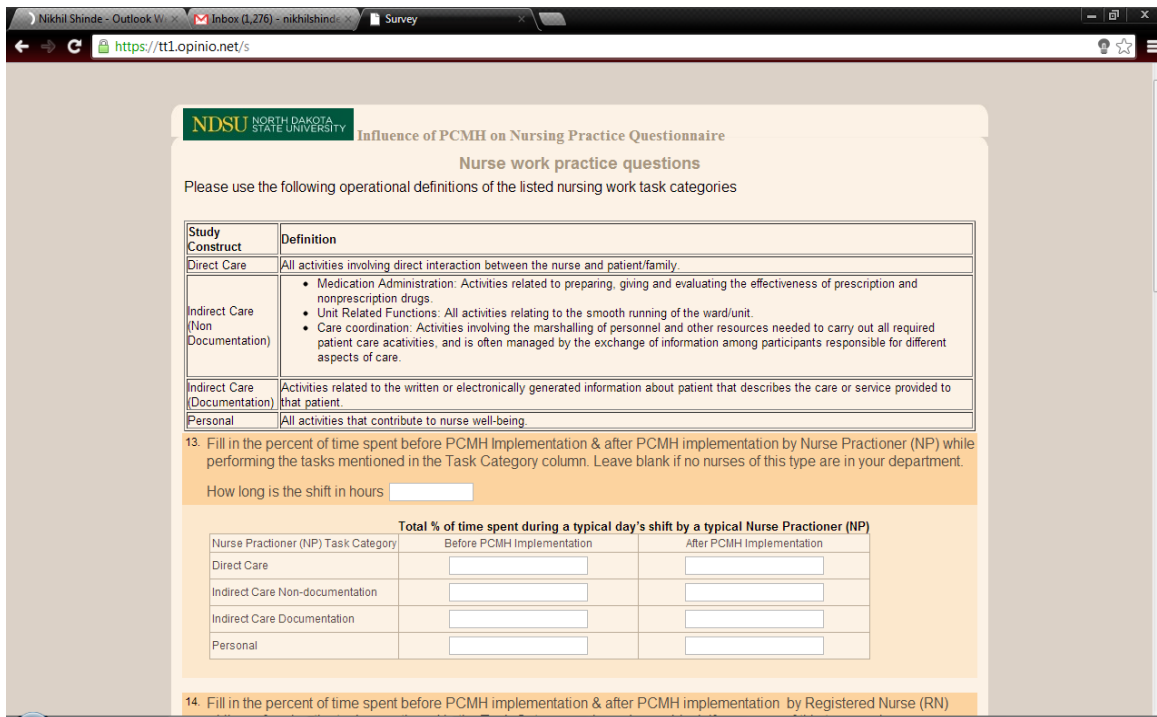
Figure C.6. Screenshot of Nurse Work Practice Questions-1.

Figure C.7. Screenshot of Nurse Work Practice Questions-2.

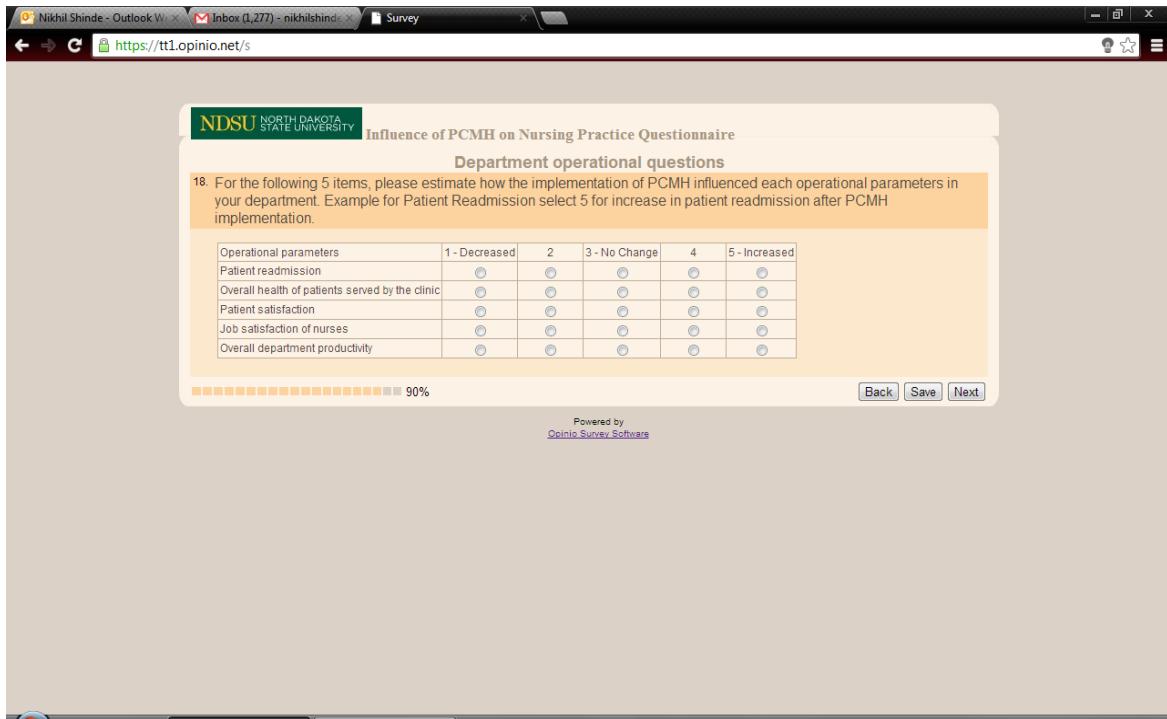Figure C.8. Screenshot of Nurse Work Practice Questions-3.
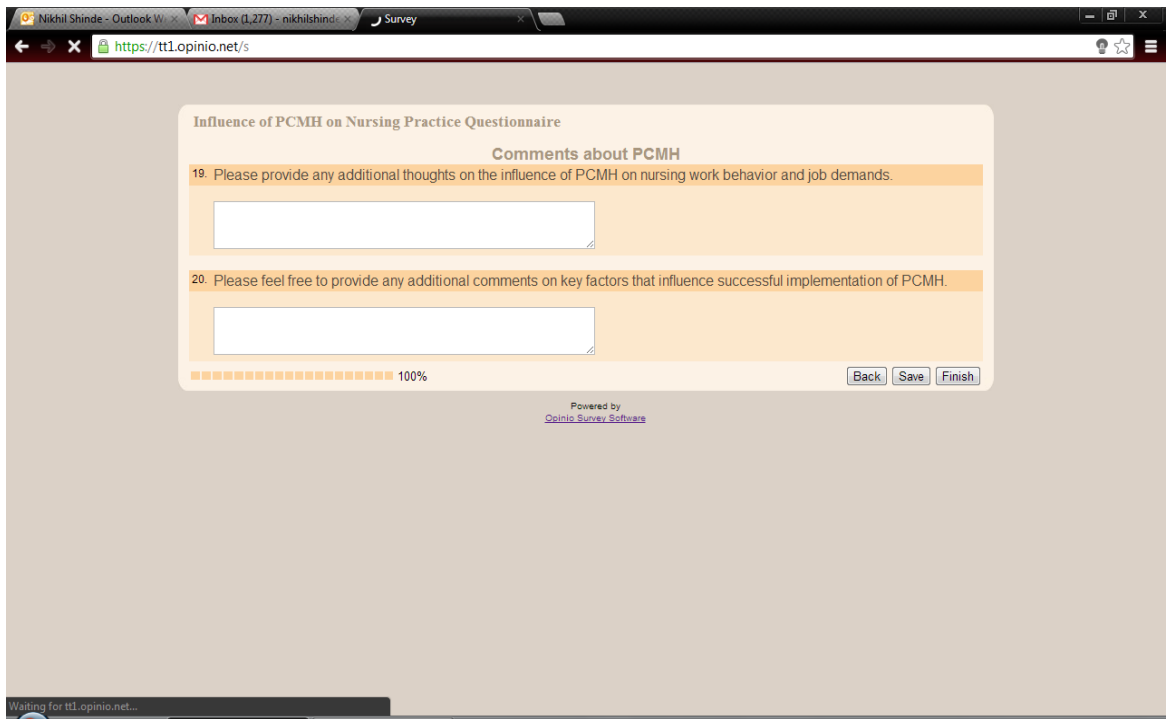
65

Figure C.9. Screenshot of Departmental Operational Questions.

Figure C.10. Screenshot of Comments about PCMH.