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# PEDIATRIC NURSES' PERCEPTION OF WORKLOAD

Pediatric Nurses' Perception of Workload in a Large System Infusion Center

Karen Walton

Submitted as Partial Fulfillment for the Doctor of Nursing Practice Degree

Regis University

April 21, 2021

## PEDIATRIC NURSES' PERCEPTION OF WORKLOAD

### **Abstract**

In this large system infusion center, there is not a current acuity-based scheduling system. The nurses' workload is directly impacted by the way patients are scheduled. The purpose of this quality improvement project was to gain an understanding of nurses' perception of their workload throughout the day. The goal is to understand perceptions to drive improvements in the way patients are scheduled. A descriptive cross-sectional design was conducted using survey methodology, demographics and five open-ended questions. The Individual Workload Perception Scale-Revised tool was used to measure manager support, peer support, unit support, workload, intent to stay, and overall nurse satisfaction. Cronbach's Alpha for each of these domains ranged from 0.64 to 0.93. The five open-ended questions were directly inquiring about what makes the best workday, the worse workday, what affects their workload, and what takes the most time during their workday. A convenience sample size of 44 nurses completed the survey which was an 88% response rate. Regression analysis found a statistical significance between peer support, unit support, workload, and the intent to stay. Pearson correlation showed a moderate positive correlation with nurse satisfaction and intent to stay ( $p = .000$ ). The survey results were overall positive. The open-ended questions revealed overarching themes. The scheduling of patients and teamwork affects their workday. If the schedule is level loaded and there is good teamwork that day the nurses are satisfied. If the schedule is not level loaded and there is not good teamwork the nurses are dissatisfied. These results can be used to support the continued improvement of how patients are scheduled. Phase two of this project is to build and implement an acuity-based scheduling system to improve level loading of patients throughout the day.

*Key words:* acuity-based scheduling, pediatric nurse perception, workload, DNP Project

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## Pediatric Nurses' Perception of Workload in a Large System Infusion Center

### Executive Summary

#### **Problem**

Currently, in this large system infusion center there is not an acuity-based scheduling system. There is a complexity to which pediatric patients are scheduled, requiring infusions and treatments. The way in which these patients are scheduled directly impacts the workload of the nurse throughout the day. The opportunity for improvement will first require an understanding of nurses' perception of their workload. This quality improvement project PICO statement is: Will the current perception of registered nurses' workload in this large system infusion center and ambulatory setting, support the need to build and implement an acuity-based scheduling system?

#### **Purpose**

The purpose of this quality improvement project was to evaluate pediatric nurses' perception of their workload in a large system infusion center. It was not meant to develop new knowledge or be generalized to other practice settings.

#### **Goal**

The goals are to provide infusion nurses and nurse care coordinators the opportunity to share their perceptions of their workload and, to assess nurses' overall satisfaction with their job. Lastly, to acknowledge those perceptions to help drive improvements in the way patients are scheduled.

#### **Objectives**

The most important objective was to use the Individual Workload Perception Scale-Revised survey and open-ended questions, to collect data that could support the implementation of an acuity-based scheduling system.

#### **Plan**

This quality improvement project used a descriptive, mixed methods, cross-sectional design. Infusion nurses, nurse care coordinators and nurses who performed in both roles were invited to participate. An evidence-based survey tool was used with demographics and five open-ended questions. Nonparametric testing in SPSS used a regression test, a descriptive statistic frequencies analysis and two split file ANOVA tests.

#### **Outcomes and Results**

A small sample size of 50 nurses were invited to participate in the study. A total of 44 nurses completed the survey which was an 88% response rate. Nurses feel that they are supported by their manager, peers, they have the resources to do their job, there is no intent to leave, and they are overall satisfied in their job. There is a statistical significance in unit support, peer support, workload with intent to stay. Over 75% of responses in the workload domain indicate that nurses do not feel pressure and urgency dominate their work environment. However, the open-ended questions revealed two overarching themes. The scheduling of patients and teamwork affects their workday.

### Acknowledgements

Thank you to Dr. Kathleen Whalen for your tremendous support, guidance, and encouragement throughout my DNP journey. Thank you to Dr. Catherine Kleiner my clinical mentor who provided much support to me along the way. Thank you to Dr. Kruschke who spent countless hours with me reviewing my project data.

I would like to acknowledge Susan Teasley, one of the authors of the survey tool used in this project. Her permission to use the tool and availability for any questions and guidance was appreciated.

Thank you to all of my friends and colleagues who have provided support and encouragement and most importantly to my husband who provided unwavering support to me over these past three years for without him I could not have accomplished this doctoral work.

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### Pediatric Nurses' Perception of Workload in a Large System Infusion Center

Pediatric patients receive highly complex infusions, including chemotherapy, cellular therapy, monoclonal antibodies, and blood products. Many of these treatments have transitioned from the inpatient setting to the outpatient ambulatory setting, which includes 80% or greater of oncology care (Edwards et al., 2017; Vortherms, et al., 2015). Specialized pediatric nurses are trained to administer these medications in a very fast-paced environment. As the demand increases for these higher acuity drugs to be given in an outpatient infusion setting, the workload of the nurse will also increase. Pediatric infusion nurses and nurse care coordinators are classified as ambulatory nurses. However, often they care for patients with a much higher acuity requiring complex care and coordination. This project focused on the workload perceptions of infusion nurses and nurse care coordinators in a large system infusion center. These infusion centers do not utilize an acuity tool and do not schedule by acuity of the patient. There is a need to understand and define the acuity of these patients to understand nurses' workload. There is very little research that identifies nurses' perception of workload acuity specific to a pediatric infusion center environment.

The Doctor of Nursing Practice (DNP) capstone project was scholarly work that focused on a clinical practice problem with an evidence-based solution to that problem (Zaccagnini & White, 2017). This capstone project concentrated on pediatric nurses' perception of workload in a large system infusion center. This paper includes a clear problem statement, the significance and scope, nursing theory used, systematic review of the literature and the market and risk analysis. In addition, clear project objectives, methodology and evaluation plan including analysis of the findings, limitations, and recommendations for a practice change are presented.

## **Problem Recognition and Definition**

### **Problem Statement**

Lack of understanding of nurses' perception of their workload throughout the day could decrease nursing satisfaction and could lead to inefficiencies in the delivery of patient care. Within this ambulatory and infusion setting, there are two registered nurse (RN) roles that carry out the administration of medications following a protocol or treatment plan, the infusion nurse, and the nurse care coordinator. The infusion nurse provides care to patients receiving infusions that take from fifteen minutes to eight hours. These patients are treated within the center for cancer and blood disorders service line as well as patients who need infusions throughout the system such as gastroenterology, rheumatology, neurology, etc. The nurse care coordinator provides care to patients across the continuum, while on treatment for cancer, bone marrow transplant and acute and chronic hematologic disorders. Both of these specialized nurses' workload on any given day is affected by the current way patients are scheduled for their treatments and infusions. Both the infusion nurse and the nurse care coordinator administer medications according to the patients' individual treatment or therapy plan.

The scheduling of patients is very complex. One patient could be scheduled for multiple appointments within the infusion and ambulatory setting in one day. The workflow for scheduling patients in the infusion and ambulatory setting is done in the electronic health record (EHR). At the present time, the EHR system does not have a way to schedule by infusion chair or by patient acuity. The schedulers only see open time slots. There is not a way to manage the length of infusions with the current system. This requires too much critical thinking and anticipation for the schedulers who are not clinical. This is not an effective or efficient use of the

schedulers time. In addition, current culture is allowing the parent to choose their time. This all impacts the current state of too many patients at the same time and too much time without patients on the schedule. More importantly it creates most of the nurses work to be done at peak times of 10 a.m. to 2 p.m. Their work is then not able to be level loaded throughout the day.

The complexity of managing a schedule that includes provider, infusion, care coordination, patient request and chair availability leads to overbooking. Overbooking leads to frustrated nurses, providers and patients and families. Verbal concerns of overbooking have been brought to the medical and nursing leadership who continue to work on improvement of scheduling templates. Patient satisfaction scores are typically high because the clinic accommodates patient and family wishes to come when it is convenient with their schedule.

The impact of scheduling has a trickle-down effect and ultimately affects the nurses' assignments at any given time throughout the day. Currently, the assignments are based upon the knowledge of the charge nurse according to the therapy that the patient is receiving. There have been some attempts to create an acuity tool without success due to the culture of overbooking. The solution might be the creation of an acuity-based scheduling system in the EHR. If an acuity-based scheduling system were to be built and implemented would the nurses utilize the system or override it? The burning question at this point is what is the nurses' current perception of their workload acuity?

### **Statement of Purpose**

The purpose of this quality improvement project was to evaluate pediatric nurses' perception of their workload in a large system infusion center. It was not meant to develop new knowledge or be generalized to other practice settings. The information provided by the nurses

caring for patients in the infusion center will guide next steps for future development of an acuity-based scheduling system in the electronic healthcare record (EHR).

### **PICO/Practice Question**

The capstone project utilizes the “PICO” question format rather than a formal research hypothesis. The PICO acronym stands for: Population or Patient (P), Intervention (I), Comparative Intervention (C), and Outcome (O) (Houser & Oman, 2011). The question this quality improvement project addressed was: Will the current perception of registered nurses' workload at a large pediatric system infusion center and ambulatory setting, support the need to build and implement an acuity-based scheduling system? In the PICO format the question reads:

P: Pediatric nurses in the infusion and ambulatory setting

I: Evidence-based questionnaire with quantitative questions and an additional five-open ended questions

C: No pre data or comparison

O: Nurses' perception of current workload acuity

According to Zaccagnini and White (2017), the Doctor of Nursing practice (DNP), is at the forefront to affect and assess change in a clinical setting and has the responsibility to apply the second DNP essential function which is to be a system leader for quality improvement.to effectively make change in the infusion clinical setting, an assessment of nurses' perception of workload acuity throughout their day. Leading this project has begun to move change forward in these pediatric infusion centers across the system.

### **Project Significance, Scope, and Rationale**

**Project significance.** As the literature supports development of an acuity-based scheduling system, it will be key to understand nurses' workload perception before any changes



are made with the current state of scheduling patients. Understanding nurse's overall job satisfaction will be the foundation of the theoretical framework relationship-based care and providing a healing environment for the patients and families.

**Scope.** The scope of this project was a descriptive design surveying a small size of infusion nurses and nurse care coordinators using the evidence-based practice survey tool IWPS-R and five open-ended questions in a large pediatric system infusion center.

**Rationale.** The literature review on acuity-based scheduling systems revealed that they are helpful at level loading patients throughout the day. An additional literature review on nurse satisfaction correlates to nurses' perception of their workload. The ability to understand the nurses' perception of workload will be the first step to begin the development and build of an acuity-based scheduling system.

### **Theoretical Foundation for Project Change**

**Relationship-based care.** The theoretical framework that was used to guide this project is based on the work of Mary Koloroutis CEO of Creative Care Management. In 2004 in collaboration with Jayne Felgen, Donna Wright, Colleen Person, Marie Manthey, Leah Kinnaird, and Sharon Dingman, Koloroutis published a book titled Relationship-Based Care: A Model for Transformational Practice. This book was based on current caring theories and models such as Jean Watson: Transpersonal Caring-Healing Framework, Kristen Swanson: Five Caring Processes, Madeline Leininger: Five Theoretical Assumptions on Caring, and Sharon Dingman: Selected Elements of The Caring Model (Koloroutis, 2004). The foundation of the Relationship-Based Care (RBC) is relationships within a caring and healing environment with the patient and family in the center. Surrounding the patient and family are a caring culture of leaders, strong collaboration and teamwork, nurses' therapeutic relationship with the patient that is key to

the nursing professional practice, shared responsibility of the managers and nurses for the resources they need to provide patient care, and the responsibility for driving great quality outcomes (Koloroutis, 2004) (See Figure 1).

**Figure 1**

*Relationship Based Care Model (Koloroutis, 2004 p. 10).*



The six components of RBC, leadership, teamwork, professional practice, patient care delivery, resource practices and outcomes are integral in the daily functions of the infusion and ambulatory setting. *Leadership* is engaged in the daily work through understanding the barriers of the schedule and its impact on nurse workload throughout the day. Through rounding, leaders empower nurses to identify and advocate for patient quality improvement as well as *resource practices*. Resource practices include staffing, supplies and tools to facilitate care delivery. Another key component is *teamwork*. Nurses work within the interdisciplinary team to deliver quality patient care. Working together amidst the demands of the daily schedule, excellent patient care *outcomes* are realized. *Professional Nursing Practice* is one component. "The nurse-patient relationship is the cornerstone of Professional Nursing Practice (Koloroutis, 2004, p. 117)". Nurses in these settings are dedicated to patient and

families and develop therapeutic relationships throughout the course of treatment. The care trajectory for infusion patients may extend up to three years or longer. As a Magnet hospital, the nurses are supported through specialty certifications and progress on a professional clinical ladder. The last component is patient care delivery. According to Person (2004), *patient care delivery* is the structure that provides the ability for a therapeutic relationship between a nurse and patient during the time of care. Infusion and ambulatory nurses deliver care based on the therapy plan or the oncology roadmap for the patient. They are the catalyst for ensuring the patient and family are ready for and receive treatment in a timely manner. The infusion nurses and the nurse care coordinators are instrumental in delivering care to ensure quality outcomes for patients. Supporting a healthy and safe work environment is essential for nursing leaders. In the infusion and ambulatory setting these components exist. Exploring nurses' perception of their workload is an opportunity to understand the resources, teamwork, and practice of the professional nurse so that with leadership support, patient outcomes and staff satisfaction may improve.

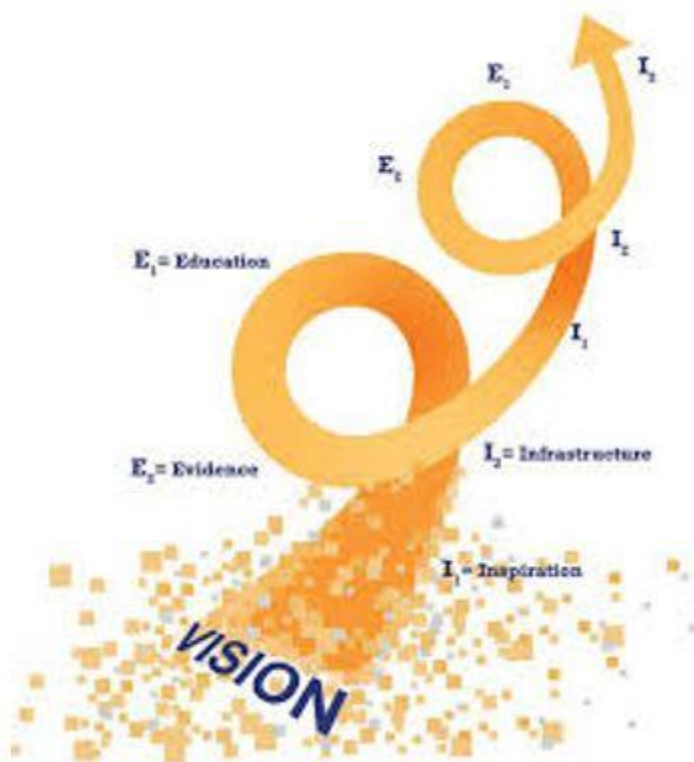
The application of this RBC model aligns with the tool chosen for this project. The evidence-based questionnaire that will be administered is the Individual Workload Perception Scale- Revised (IWPS-R) (Cox, et al., 2010). Use of the IWPS-R instrument will provide a foundation of information of current state of nurses' perception of workload and their overall job satisfaction.

**Change Theory.** The change theory (see model Figure 2) that was used in this project is Jayne Felgen's formula for leading change. The four elements of this theory are: Inspiration I1 Infrastructure I2 Education E1, and Evidence E2 (Koloroutis, 2004). Inspiration and infrastructure I2 are the first half of the formula. Inspiration is when the person feels they are

contributors to something that is of value and their leader has a clear vision of change they can follow, and infrastructure is what is needed for the vision to be achieved such as practices, systems and processes in place (Koloroutis, 2004). Education and Evidence E2 is the second half of the formula. Education instills confidence in the person to function at their highest level of skill set that will enhance the change and evidence shows that change has been implemented and staff members begin to know that work is being done, see the progress and feel a sense of accomplishment (Koloroutis, 2004).

Figure 2

*Felgen's Change Model (Koloroutis, 2004 p. 8).*



Koloroutis (2004), explains that when transforming practice, a leader must understand five key components that must be present that will support team members' ability to be active and engaged with change for I2E2Formula to work:

- *Clarity.* Understanding the “why” a change is happening, the benefits of the change, what success looks like, what their responsibility and accountability is, allows them the opportunity to be a part of the action to make the change.

- *Competency.* Willingness to participate in the change process individuals must know what is expected of them and have the knowledge and skills needed for the change to happen.

- *Confidence.* Once individuals have the competency and the knowledge, they gain the confidence in knowing what contributions they will make for this change.

- *Collaboration.* The confidence and competence bring forth the ability to collaborate with other team members establishing shared goals and gain respect for each other' contributions to the work or change.

- *Commitment.* As clarity, competence, brings forth confidence and the ability to collaborate, this will also bring forth a commitment to creating shared goals that will include individual contribution to the change.

Using this model, nurses' perception will be the evidence that drives change. The evidence will inspire and support infrastructure change. It is anticipated that any changes will require education to further the adoption of new practice.

### **Literature Selection/Systematic Process**

A literature search began in 2018 with a focus on acuity-based scheduling models and how they can improve patient scheduling in pediatric infusion centers thus, improving nurses'

workload throughout the day. As the PICO question for this project was refined a second literature search was completed focusing on pediatric nurses' perception of their workload.

The subject of the first systematic review was acuity-based scheduling models. Databases searched included CINAHL, with full text, MEDLINE via EBSCO, Academic Search Premier, and Google Scholar. The key search terms used were acuity-based scheduling, pediatrics, infusion center, oncology clinic, acuity-based staffing, nurse workload, chemotherapy, and outpatient. Inclusion criteria included articles that were (a) peer reviewed, (b) written in English, (c) published between 2013 and 2020, (d) addressed nurse workload when creating an acuity-based model, and (e) oncology adult and pediatric outpatient acuity-based models. Articles were excluded from the review for the following reason: (a) only patient satisfaction was addressed and not nurse workload, (b) acuity-based scheduling that studied inpatient workload and, (c) non-oncology clinics. The initial search yielded 36 articles. After review of all abstracts and using the inclusion and exclusion criteria six articles were chosen.

The subject of the second systematic review was nurses' perception of their workload. The databases searched were CINAHL with full text, MEDLINE, Academic Search Premier, and Google Scholar. The key search terms were pediatric, infusion nurse, perception of workload, pediatric oncology, and job satisfaction. Inclusion criteria included (1) written in English (2) published between 2002 and 2020 (3) evaluation of nurses' perception of workload using the IWPS-R (4) observational studies of nurses' workload in an oncology setting. Articles were excluded from this review for the following reasons (1) evaluation of patient perception of satisfaction (2) observational studies in a non- oncology setting. There were 232 articles found initially. After thorough review of the articles and following the inclusion and exclusion criteria the final number of articles for this subject is eleven.

**Scope of Evidence**

Melnik and Fineout-Overholt's (2015) seven tiered levels of evidence were used to rate the level of evidence of the 17 articles chosen for this project. Two studies were level III using control groups without randomization and using pre and post data after an implementation. Thirteen of the articles are level VI descriptive studies. Of the 13 descriptive studies four were descriptive computational studies using discrete simulation models that produce statistical distribution of data being collected (Baril et al., 2016). Two studies were descriptive utilizing the Individual Workload Perception Scale tool (IWPS), and four utilizing the Individual Workload Perception Scale-Revised (IWPS-R). Of the remaining two descriptive Level VI studies, one utilized a work sampling method and a work perception tool was used. The other study was a descriptive observational study. There were two articles found in the literature that were level VII which are deemed opinion or consensus (Melnik and Fineout-Overholdt, 2015). The first was a concept analysis. The author of this article wanted to understand the concept of nurse workload based on the evidence in the current literature. The second was a review of six tools that assessed nursing workload and environment.

The majority of this evidence was a level VI which is a limitation of this project. A further literature search is needed. However, according to Houser and Oman (2011), a higher level of evidence is needed when making decisions that affect patients. There will be no patients involved in this project. This project is a quality improvement initiative and the descriptive studies presented support the importance of understanding nurses' perception of workload as there is limited research related to pediatric infusion nurses.

### **Background and Review of Evidence**

The first themes that will be discussed are related to acuity-based scheduling. Six articles will be discussed with an overall summary at the end. The next seven article's themes discussed will be regarding nurse workload and nurse perception of nurse workload followed by a summary. See Appendix A for an example of one article review using a systematic review of evidence table.

#### ***Acuity-based Scheduling Themes***

**Use of Scheduling Models (Mathematical and Optimization).** Liang et al. (2015), studied patient flow in an outpatient oncology clinic, specific to chemotherapy appointments. This included using a software model developed to evaluate clinic flow and identified initiatives on which to focus. Additionally, a mathematical programming model was developed to balance scheduling. Overall, this study showed improved level loading of the schedule when additional methods for scheduling were implemented.

A second study by Liang and Turkan (2016), focused on specific acuity-schedule for nurse assignments. This study created a scheduling optimization model. An optimization scheduling tool was created in their oncology clinic. The schedule was built by hours of infusion and appointment times. Two care delivery models were studied. In the first care, patients were scheduled for an appointment without knowing the availability of the nurse. Nurses are scheduled by the acuity of patient and nurse skill mix. Additionally, the patient was not always receiving care from the same nurse on subsequent days. In the second care delivery model, the patient was assigned the same nurse and was scheduled according to the nurse's schedule. The aim of the study was to develop a scheduling optimization tool to reduce the time spent on nurse assignments and on patient scheduling. This tool would be used to schedule both models and



compare. The functional care delivery model favored the nurse assignment resolution, while the primary care delivery model favored the patient scheduling resolution. According to Liang and Turkan (2016), further study of measuring staffing cost, patient experience, and patient safety will need to be done to make a fair comparison.

Alvarado and Ntaimo (2016) created three optimization simulation models for scheduling chemotherapy patients. Each focused on a certain part of the scheduling process. Acuity and infusion time were prioritized along with the nurse availability. The study aim was to decrease patient wait time, decrease nurse overtime, and increase throughput. The results showed the new system outperformed the previous scheduling system.

**Positive Outcomes with Acuity-Based Scheduling Systems.** Vortherms, Spoden, and Wilcken (2015) developed a point-based acuity system to guide the schedulers in making appointments. The aim was to provide equity in workload among the nurses, increase patient satisfaction and employee engagement. Their research correlated nursing assignments with effective patient flow. A multi-disciplinary team was created to develop the point-based acuity system. While they did not create the tool based on infusion length, infusion length is what was used to create a point system. The investigators developed a paper worksheet assignment tool to be used by the schedulers. A six- month pilot was implemented utilizing two RN project team members to review the schedule. Four RN assignments each day were included in the pilot. The other nurses were assigned “first come, first served”. Patients were pre-assigned into the pilot group, but not in the normal scheduling flow group. The pilot was successful with data showing that RN engagement increased, patient satisfaction increased, and patients were scheduled with more accuracy according to the workload acuity for the nurse.

Edwards et al. (2017), implemented a study evaluating an acuity-based scheduling system (ABS) to improve scheduling in an oncology clinic. The ABS was built according to six infusion types according to length. Patients were scheduled by chair and next available nurse. The template was created utilizing 30-minute time-slots and no more than two were scheduled at the same time. Pre-and post-scheduling data were collected. In addition, patient satisfaction was measured. There was an improvement in level loading the schedule as well as utilization of infusion space. There was an overall improvement in patient and nurse satisfaction.

DePadova (2019) studied throughput in an outpatient pediatric hematology, oncology, and bone marrow transplant clinic. A second aim of the study was to gain knowledge of the clinic staff's perception of patient throughput and seek help for improvement. One significant finding of this study was the scheduling of patients and the differences by appointment type, appointment time and appointment non-compliance were significant.

Overall, the common theme in the literature is focused on scheduling patients for chemotherapy in oncology clinics with a goal of optimizing evenly distributed workload throughout the day. Increased requests for the administration of outpatient chemotherapy results in increased wait times, decreased patient satisfaction, decreased nurse satisfaction and not insufficient available patient appointments. Although there were common themes, each study had a different approach in addressing the problem. Addressing the issue through statistical analytics was one approach, while others developed simulation models that would be implemented into the scheduling template. One study addressed a nurse care delivery model that evaluated how the patient was assigned to a nurse. The studies did not specify patients being seen in an infusion center. They referred to the patient being seen in an oncology clinic. One limitation to these studies were that all but one were in adult settings. Pediatrics has a different

set of potential variables and should be studied separately. Pediatric nursing requires special attention to developmentally appropriate care of the patient (Cox et al., 2007). After the review of this literature, it was concluded that there is a need for this issue to be studied in a pediatric setting.

### *Nurses' Perception with Workload Themes.*

**Definition of Workload.** Workload is a common term used but not clearly defined in nursing. Alghamdi (2016) completed a concept analysis with the aim to develop an understanding of the concept 'workload' in nursing based on evidence in existing literature. There were five categories found to be consistent in the literature: amount of nursing time, the level of nursing competency, the weight of direct patient care, the amount of physical exertion and the complexity of care (Alghamdi, 2016). One implication from the literature is that nursing leaders must pay attention to workload issues related to the nature of nursing work, which will ultimately affect productivity, work stress, job satisfaction and job turnover. Based on this analysis a proposed definition was created. "Nursing workload is the amount of time and care that a nurse can devote (directly and indirectly) towards patients, workplace and professional development (Alghamdi, p.455, 2016)".

**Assessment tools of nursing work environment.** Gu and Zhang (2014) assessed several tools to measure nursing work environment for evaluating nurses work environment in China. This assessment reviewed six different tools: Nursing Work Index (NWI), Nursing Work Index-Revised (NWI-R), Practice Environment Scale of the NWI (PES-NWI), Essentials of Magnetism (EOM) instrument, Perceived Nursing Work Environment (PNWE) instrument, and the Individual Workload Perception Scale-Revised (IWPS-R) tool. According to Gu and Zhang (2014), these six tools have been used many times by administrators in magnet and non-magnet

hospitals to assess the nurses work environment. This assessment explains that the dimensions and items of each tool are different, with the majority of focus being manager support, interpersonal relationships, and job autonomy (Gu and Zhang, 2014). Gu and Zhang (2014), further explain their assessment in that the NWI has the largest range of content identifying the actual status of the work environment although some items are no longer relevant, the PES-NWI has an advantage as it evaluates nursing practice environment at a hospital level, the EOM has characteristics for magnet and lastly, the PNWE and IWPS-R concentrate on subject perception of the nursing work environment. Gu and Zhang (2014), concluded that evaluating nurse work environment is complex realizing that most assessment tools take place in Western countries, and they will need to tailor for the medical environments in China.

**Use of Individual Workload Perception Scale (IWPS) to Study Nurses' Perception of Workload.** Cox et al. (2007), studied pediatric nurses' perception of work environment. This study wanted to identify if there was a difference if nurses worked in a non-pediatric setting, the type of pediatric setting and the year of birth of the pediatric nurse. This study was a descriptive design using the initial Individual Workload Perception Scale (IWPS). This tool is a 46 item Likert instrument assessing nurse perception of manager support, peer support, unit support, workload perception, and intent to stay (Cox et al., 2007). Overall pediatric nurses have more positive perceptions of unit support and overall satisfaction than those in combined pediatric and adult settings. Compared to other units within the pediatric setting the critical care and urgent care areas have a high perception of their work environment compared to nurses working in other areas such as, inpatient or the ambulatory setting. Lastly, all ages of pediatric nurses had a positive perception of peer and the least for manager support and younger nurses had more

positive perception of peer support, unit support, workload, and job satisfaction than older nurses (Cox et al., 2007).

A second study using the IWPS instrument, assessed the relationship between workload, burnout, and intent to leave with medical surgical nurses (Phillips, 2020). Burnout and nurses' perception of workload factor into their intent to leave (Phillips, 2020). The author reiterates that this information is important for leaders to know before they begin improving the work environment.

Four articles retrieved were directly related to measuring nurses' perception of workload (Lacey et al., 2009; Lin et al., 2010; Ross, 2017; Suliman et al., 2018). All four descriptive studies utilized The Individual Workload Perception Scale-Revised (IWPS-R) questionnaire. Lacey et al. (2009) studied the difference between pediatric nurses' perception with overall satisfaction and intent to stay in a Magnet designated hospital verses a non-Magnet designated hospital. The overall finding is that Magnet hospitals do improve nurses' perception of organizational support and a healthy environment. Lin (2011), assessed nurses' perception of workload with inpatient nurses in southern Taiwan. They found acceptable reliability with the instrument. There overall assessment was that the data was helpful in identifying nurse perception is essential for leaders to understand to be able to ensure they are leading a positive work environment. The third study was unique from the other four studies as it was not studying inpatient nurses. Ross (2017), studied peri anesthesia nurses' perception with workload and intent to stay. Two themes that came out of this study were nurses who had an assigned preceptor had a higher perception of organizational support, workload, and overall satisfaction. The second, was nurses who were certified had better perceptions of workload and intent to stay (Ross, 2017). The last study looked at nurse work environment related to indicators of

satisfaction (Suliman and Aljezawi, 2018). The author's surveyed nurses that worked in public and private hospitals in the country of Jordan. Findings indicate nurses working in public hospitals had better perceptions of their work environment than those at private hospitals and older nurses with lower academic qualifications report higher job satisfaction and third the higher the support of peer and manager the higher they would stay in their jobs (Suliman and Aljezawi, 2018).

**Observational Studies and Interviews with Nurses to assess Workload.** Three studies focused on the observation of nurse's workload in an oncology setting. Observational time studies were done to assess the length of nursing tasks such as chemotherapy administration, time away from the patient, and nurse availability (Baril et al., 2016; Huggins et al., Souza et al., 2013). Baril et al. (2016) studied through a discrete simulation model, the observation of nurse's workload and patient flow throughout a hematology oncology clinic. Nurses' work was analyzed looking at workload throughout the day. The problem identified was the distribution of the schedule increased nurses' overload in the morning. An additional finding was that there was no need to increase staffing if the schedule was level loaded throughout the day (Baril et al., 2016). A study done by Huggins et al. (2014) was to assess balancing of nurses' workload with a patient care technician (PCT), ultimately, improve quality of care in an outpatient cancer clinic. Nurse interviews were conducted to help understand tasks that they perform. From those interviews' tasks were identified, and the researchers began observations of the nurses and the PCT at work. A pilot was performed giving the PCT extra duties within their scope thus, relieving the nurses from those activities. The results were that by balancing the nurses work with a PCT, the nurse was available more often (Huggins et al., 2014). The last of these three studies was measuring of nurses' workload through observation using a work sampling technique

in an oncology clinic in Brazil (Souza et al., 2013). A combination of interviewing nurses, administration of a questionnaire and document analysis, nursing tasks were identified. A validated tool was developed from this information. This tool included the following categories: direct care, indirect care, associated work, and personal activities. An observational pilot was completed, and the findings were that nurses spend more time on indirect patient care than direct patient care (Souza et al., 2013).

Understanding nurses' workload perception will be key for further discussion of implementation of an acuity-based scheduling system. The connection of the two will begin to identify the exact needs related to nurse's workload acuity throughout the day. After review of the evidence there is a need for additional pediatric studies of nurses' workload perception. The overall limitation of this theme is there were no studies found directly related to pediatric nurses' perception of workload in an infusion center and ambulatory setting. Strengths of this evidence are that four studies used the validated tool IWPS-R. In addition, two studies used the original IWPS tool. This is an evidence-based tool that will be used in this project.

### **Project Plan and Evaluation**

#### **Market/Risk Analysis**

##### **SWOT**

According to Zaccagnini and White (2017), a SWOT (strengths, weaknesses, opportunities, and threats) analysis gives the DNP project leader a way to understand the strengths of their project and how to plan to address the weaknesses of their project. A SWOT analysis was completed for this project (see Table 1). Strengths include high employee engagement scores and high patient satisfaction scores. The employee engagement survey is one that is done within the organization, these scores are typically over 4.0 out of 5.0. The patient

satisfaction survey is done through the National Research Catalyst (NRC) monthly and the overall average is in the high 80th percentile. Both of these surveys do not specifically ask about wait times, however, there have been comments with the NRC patients stating “everything was great except the wait times. Another strength is that providers do trust the nurse’s skills and ability to give quality of care. The faculty surveys are done yearly and also internal. They are asked about their confidence with nurses’ expertise and skill to care for patients, and it is in the high 90th percentile. The strength of the evidence-based survey tool that will be used is a strength as it has been validated through over 3,000 nurses who have taken the survey. A threat that is mentionable is that the results will not show a correlation with the scheduling of patients. This could lead to not supporting the need for an acuity-based scheduling system. Another threat is that nurses are satisfied with the way the infusion center operates and will not support change.

**Table 1***SWOT Analysis*

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Employee engagement scores</li> <li>• Magnet Organization</li> <li>• Patient Satisfaction</li> <li>• Providers trust nurses’ quality of care given</li> <li>• Use of validated survey tool</li> <li>• Value nurse input</li> <li>• Support of leadership to administer questionnaire</li> </ul>	<ul style="list-style-type: none"> <li>• Perception of nurses’ workload</li> <li>• Overbooking of patients</li> <li>• Lack of nurse participation</li> <li>• Small sample size</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• Greater understanding of nurses’ perception of workload</li> <li>• Perception of workload with support change in scheduling of patients</li> <li>• Present findings to the IWPS-R study group who created the tool</li> </ul>	<ul style="list-style-type: none"> <li>• Nurses’ perception of workload will not correlate with scheduling of patients</li> <li>• Results could show dissatisfaction</li> <li>• Nurses might leave</li> <li>• COVID-19 could affect perceptions</li> </ul>



**Driving, and Restraining Forces****Driving Forces**

A key driving force for this project was to understand nurses' perception of their workload and to provide them the opportunity to have their voice heard. The ultimate driving force for this project is that the nurses' perception will drive change to improve the way patients are scheduled for their treatments by acuity and level loading nurse assignments. In other words, nurses will have an evenly distributed patient assignment throughout the day instead of having a cluster of patients all at once. Through leader rounding, nurses voiced continued frustration with the way patients are scheduled and how it affects their day. This will ultimately affect patient and provider satisfaction. A second driving force is through the evidence noted in this project, implementation of an acuity-based scheduling system does increase efficiencies of workflow and patient level loading. There is a need for change and the results of this study will hopefully drive change. Another driving force is the opportunity to share the findings of this quality improvement project as there is limited literature available.

**Restraining Forces**

One restraining force is timeliness of the Institutional Review Board (IRB) through Regis University and to clinical site approval through the Organizational Research Risk and Quality Improvement Review Panel (ORRQIRP). These restraining forces were completed timely and had no interference with the implementation of the survey. The ability for leadership to support the nurses to take the survey is a second restraining force. The lack of time at work for the nurses to take the survey could require them to take it on their off hours. This could incur increased cost to the budget. This was not an issue there was 88% participation and the survey according to many of the participants only took 10 to 15 minutes to complete and there was no

overtime accrued. If the results of this study show there is a need to improve the way patients are scheduled, will there be leadership support to make this change is the last restraining force.

### **Need, Resources, and Sustainability**

**Need.** The complexities of the scheduling process directly impact the nurses' workload throughout the day. A literature review identified that an acuity-based scheduling system could help in level loading a schedule thus impacting better workflows for the nurses. Before implementing a change, it was important to hear the voice of the nurses and to understand their current perception of their workload and their overall satisfaction.

**Resources.** The resources needed to conduct this QI project involved the implementation of the IWPS-R survey. This survey was uploaded into Research Electronic Data Capture (REDCap) database. This project lead gained access of this database by completing REDCap modules and testing. A process improvement resource was given to this project lead to build the survey into the REDCap system. The survey was administered via email with a link and an additional QR code that nurses could access on their phones. The nurses supported by leadership to cover their patients while they took the survey. The expected time to take the survey was 30 minutes, however, many nurses reported that it only took them 10 to 15 minutes.

**Sustainability.** The next steps of this QI project will require next steps to improve the way patients are scheduled. This will require stakeholder and leadership support. There will be a need to identify a core team to work toward improvement. The key stakeholder is the nurses. Empowering nurses to be involved with the change and to be heard through the survey will validate their experience. Building strong partnerships with informatics, statisticians, infusion center leadership, and process improvement will be key to developing, building, and implementing an improved way of scheduling the patients by acuity and throughout the day.

**Feasibility/Risks/Unintended Consequences**

**Feasibility.** The implementation of this QI project was feasible as the setting was similar to the settings that were reviewed in the literature. The administration of the survey was feasible as it required minimal resources and was easy for the nurses to access and the time required to take the survey was minimal.

**Risks.** There was no risk or harm to the nurses who participated in this QI project. The project lead provided an educational email with the survey link. By taking the survey it was their informed consent. Confidentiality was maintained and data was de-identified.

**Unintended Consequences.** One unintended consequence was that there was no control of the nurses' workload on the day they took the survey. This could have had an impact on the way they answered the questions, positively or negatively. The education given to the nurses about this project as it relates to ultimately making improvements with the way patients are scheduled, could have affected the way they answered the questions.

**Stakeholders and Project Team****Stakeholders**

The key stakeholders of this project are the infusion nurses and the nurse care coordinators as they were invited to participate in the survey. Additional stakeholders would be anyone that would be impacted by a change with how patients are scheduled including patients, families, providers, schedulers, associate clinical managers, and the clinical managers.

**Project Team**

The project team consists two clinical managers, two associate clinical managers, clinical site mentor, Sr. data analyst, management analyst and faculty chair. The Sr. data analyst and management analyst have been able to provide a resource to this project as it relates to the survey

tool and future data analysis. The clinical managers are key as their infusion centers will be affected by the results. It will be important to have their support and for them to have the knowledge of the process and progress with this project.

### **Cost-Benefit Analysis**

A cost benefit analysis measures the real cost of the DNP project. The goal is to have the benefits of the project out-weigh the costs (Zaccagnini and White, 2017). There was minimal financial cost for this project (See Appendix B). Written permission to use the IWPS-R survey tool has been granted at no cost. Use of an online platform to transfer the IWPS-R questions and demographics into the online survey that will be administered could incur a cost. This will depend on which platform is chosen. Another cost was purchase IBM SPSS statistics software for use of data analysis. According to Cox et al., (2010), the average time it takes for a nurse to complete the survey is twenty minutes. The goal was to have the clinical managers support the nurses taking the survey during work hours by providing coverage to step away to take the survey. Future costs will be the next phase of this project which is developing and implementing an acuity-based scheduling system in the EHR.

The benefit to this project will be first to understand nurses' perception of their workload. This will ensure that their voice was heard. The nurses will feel heard and be empowered to be a part of change that will ultimately, optimize patient care and efficiencies in their workplace. As the nurses' feel heard, turnover will decrease. The onboarding of a new nurse is between \$60,000 and \$80,000 conservatively. The data evaluated from this project will be of benefit as a platform for next steps in creating an acuity-based scheduling system.

**Mission/Vision/Goals****Mission and Vision.**

The mission for this project is to gain a foundational understanding of nurses' perception of workload and their overall job satisfaction. The vision is to optimize care provided to this pediatric population of patients.

**Goal.**

The end goal is to use the nurses' feedback in stage II of this project, to develop and implement a new acuity-based scheduling tool across all of the infusion centers that will allow for stabilization of patient's schedule over the course of the day.

**Outcome Objectives**

The first objective is to use the demographic data to understand differences in workload perception between infusion nurse and nurse care coordinators as well as between the network of care sites and the main infusion center. The second objective was to analyze the quantitative data to gain an understanding of nurses' perception of workload and overall job satisfaction. The third objective was to identify themes of workload perception by asking the nurses the five open ended questions. The last objective is to identify a need for the next phase which is developing and implementing an acuity-based scheduling system.

**Logic Model**

A logic model (Appendix C), will be foundational for developing an acuity-based scheduling system across this large system infusion center. According to Zaccagnini and White (2017), a logic model will allow a visual for how the project will work. While the visual for an acuity-based scheduling system is the goal, it will be important to include in the visual nurses'

perception of workload. Through utilizing an evidence-based survey tool, this project will focus on understanding the infusion nurses' current perception of workload acuity.

The development and planning of this project's logic model included identification of the resources needed to complete this project. Resources such as, identification of a survey tool that would be used, receiving permission to use the tool as well as revise the demographics' data desired. Additionally, the resources needed to develop this tool into an online platform to administer to the nurses. An overview of constraints identified an understanding budgetary need and time nurses will need to take the survey as well as the timeline for IRB approval for this project from Regis University and the clinical site where this survey is being administered.

After planning and implementation of the survey tool the next steps in the logic model is to evaluate and interpret the results. The short-term goal is to begin to understand nurse's perception with their workload, while the long-term goal is to ask do the results support the need for change.

The last step of the logic model is identifying what the impact of this project will be for to the nurses. Understanding nurses' perception of their workload will be very impactful information moving forward and will set the stage for next steps. This will be the first assessment of workload specifically of infusion nurse and nurse care coordinators. The knowledge that will be gained about nurses' job satisfaction overall will be a key in moving forward with an acuity-based scheduling system. This will allow unit leaders to have baseline data before any changes are made and then be able to compare nurse job satisfaction and workload once changes are made. The overall impact will be the improvement of the quality of care that the patients receive when they are getting their treatment while in the Infusion Center.

**Population/Sampling Parameters**

According to Terry (2018), a convenience sampling is a population that is easily available and able to participate. The target population for this project was a convenience sample of RN's who work in the infusion setting and the ambulatory setting of this large system infusion center. An additional subset of nurses who work in both roles will also be surveyed. A third subset of nurses who work in the sedation clinic were excluded as their workload is not related to overbooking and is impacted differently. There were fifty nurses who were invited to participate in the survey and 44 participants actually took the survey. This is an 88% response rate. (See Appendix D for example of the enrollment script).

**Setting**

This project was conducted at a large pediatric hospital with multiple infusion centers across its system. There are four infusion centers across the system. These infusion centers are housed within the pediatric cancer center at this organization. The infusion centers act as the emergency department for pediatric hematology, oncology, bone marrow transplant and cellular therapy patients during the day. In addition, they provide infusion services for many other patient populations such as rheumatology, gastroenterology, endocrinology, metabolic, pulmonology, nephrology, dermatology, allergy, immunology, and neurology. The largest infusion center has thirteen beds and four chairs. The average patients per day is 35. A typical assignment for the infusion nurse is five to seven patients throughout the day. Patients also receive infusions when they are in the ambulatory setting within these infusion centers. These are chemotherapy infusions administered by the nurse care coordinator. A typical assignment for a nurse care coordinator is ten to twelve patients per day. The three other infusion centers are located in this organizations network of care (NOC) throughout the state. Two of

these infusion centers have six private rooms and four chairs. The average daily census is anywhere from five to 15 patients a day. The infusion nurse ratio is four patients throughout the day. The nurse care coordinator will have five to 10 patients throughout the day. The third infusion center newly opened in Spring of 2020, and it has four private rooms and four chairs. There is not a nurse care coordinator at this location. There are two nurses scheduled each day, and they are currently averaging 6 to 10 patients per day.

### **EBP Design Methodology**

This quality improvement project was intended to examine nurses' perception of workload through dissemination and evaluation of a descriptive, mixed methods, cross-sectional non-experimental survey. A descriptive study is one that is trying to answer a question rather than a hypothesis and is usually a result of lack of literature available that is of interest to the researcher (Terry, 2018). A mixed method design is used to obtain both qualitative and quantitative data and will gain a broader perspective of the data (Terry, 2018). This survey took place in October 2020 and was administered through an online survey, which is a cross-sectional study (Terry, 2018). The demographic data allowed the DNP lead of this project to understand and compare both the infusion nurse and nurse care coordinator's perceptions. The open-ended questions provided additional data that was not captured in the survey.

### **Instrumentation Reliability/Validity and Intended Statistics**

#### ***Demographic Instrument***

The first instrument is the demographic information (See Appendix E). The purpose of the demographics' information is to correlate IWPS-R responses with demographic variables (Cox et al., 2010). Written permission has been granted from the author (See Appendix F), to revise the demographics that will be appropriate for this targeted population. These demographic



variables include generation, academics, years of experience, geographical location of work, nurse role, and additional ones as listed in the demographic tool. The demographics form was approved by clinical mentor and senior data analyst at clinical practice site.

### ***Individual Workload Perception Scale-Revised (IWPS-R)***

The development of the Individual Workload Perception Scale-Revised IWPS-R instrument was based on Maslow's Theory of Human Motivation. This theory explains how a person moves through a hierarchy of needs such as physiological, safety, belonging, esteem, and self-actualization. A person is most concerned with their physiological needs and then moves up through the hierarchy once each step is met (Cox et al., 2010). Just as in Maslow's hierarchy of needs, nurses must get their basic lower-level needs met before leaders can implement anything in the higher-level needs. The IWPS-R tool measures lower-level needs that include physiological, safety and belonging. (See Table 2).

**Table 2**

*IWPS-R Questions based on Maslow's Hierarchy of Needs (Cox et al., 2010)*

Physiological	"I am able to take at least a 30-minute meal break during my shift".
Safety	"If the nurse manager is off duty the unit is encouraged to contact her/him when there are staffing difficulties." "Equipment for patient care is available when needed".
Belonging	"The nurses on my unit are a team".

**The Individual Workload Perception Scale-Revised (IWPS-R)** (See Appendix G), is a validated 29-item Likert-scaled instrument "which measures nurses' perception of workload, intent to stay and overall nurse satisfaction" (Cox et al., 2010). Within the instrument are five sub-scales: manager support (MS), peer support (PS), workload (WL), intent to stay (ITS), and overall measurement of nurse satisfaction (NS) (Cox, et al., 2010). The questions are distributed among the five subscales (See Table 3). These subscales have been validated and tested for

reliability with the higher the number as the most desired. The operational definitions are found in Table 4.

**Table 3**

*IWPS-R Item Distribution (Cox et al., 2010).*

Subscale	Number of Items	Items	Reverse Score Items
<b>Manager Support</b>	8	1,5,9,14,20,21,24,27	None
<b>Peer Support</b>	6	7,8,15,16,26,29	None
<b>Unit Support</b>	6	6,10,12,18,19,25	None
<b>Workload</b>	6	2,3,4,11,22,28	11,22
<b>Intent to Stay</b>	5	11,13,17,23,28	11,13,23
<b>Nurse Satisfaction</b>	19	MS, PS, US, WL, & ITS	11,13,22,23
Total	29 (with 11 & 29 dual loading)	Note for all subscales a higher value is desired.	

**Table 4**

*IWPS-R Subscales Definitions (Cox et al., 2010).*

Subscale	Operational Definition
<b>Manager Support</b>	<i>The extent to which nurses perceive their supervisors are helpful and concerted about their needs</i>
<b>Peer Support</b>	<i>The relationship that the nurses have with each other</i>
<b>Unit Support</b>	<i>The extent to which nurses feel they have access to supplies, materials, resources, and services they need to do their job</i>
<b>Workload</b>	<i>The extent to which pressure and urgency dominate the work environment</i>
<b>Intent to Stay</b>	<i>A predictive subscale that attempts to measure the likelihood that nurses will stay in their job</i>
<b>Nurse Satisfaction</b>	<i>The overall nursing satisfaction score is derived through averaging of the subscales</i>

The **WPS-R** is a validated instrument and reliable instrument. It will provide a foundation of information of current state of nurses' perception of workload and the aggregation of all questions will give an overall nurse job satisfaction score. Face and content validity were established based on work by the Federation of Nurses and Health Professionals and through literature and expert reviews (Cox, et al., 2002; Cox, et al., 2010). Cronbach's Alpha (coefficient alpha) is the more frequent calculations used to measure internal consistency and reliability, with a normal range between .00 and +1.00 (Polit, 2010). The IWPS-R internal consistency was measured using Cronbach's Alpha. Each of the independent variables; MS, PS, US, and WL was analyzed with logistic regression and with a designated cutoff score for the dependent variable, ITS (Cox et al., 2010). This instrument's alpha coefficients ranged from 0.68-0.93. According to Polit (2010), a range of .70 to .75 are sufficient at subscale level, however, values above .80 or greater provide increased internal consistency (Polit, 2020). The internal consistency of this project using this tool showed a Cronbach's Alpha range of .64 to .93. See Table 4.

**Table 5**

*Validation of IWPS-R (Cox et al., 2010).*

Subscale	Cronbach's Alpha
Manager support	.77
Peer support	.89
Unit support	.64
Workload	.84
Intent to stay	.93
Nurse satisfaction	.93

A more recent study by Ross (2017), looked at workload and intent to stay perceptions of peri anesthesia nursing units. The specific aim was to assess overall perception of work environment intent to stay and job satisfaction. A second desire was to understand if there was a difference in perception between board certified nurses and those that were not. Using the IWPS-

R item distribution results was proven to be valid. Ross's coefficients ranged from .87 to .81. Intent to stay was .88 and overall satisfaction was .92 (Ross, 2017).

### ***Open-Ended Questions***

The third instrument is an additional five open-ended questions. According to Terry (2018), qualitative research is how members of the culture being studied perceive their own world. While this is not a research project that will provide new knowledge, these questions will provide themes that can be analyzed. These questions were developed by this project lead and content validity was assessed with the clinical managers at each site. These open-ended questions will provide nurses' the opportunity to describe their perspective what is 'a perfect workday', 'what makes it the worst workday', 'what affects their workload during the day', 'what tasks take the most time during their workday', and lastly, 'is there anything else they would like us to know' (See Appendix H).

**Intended Statistics.** Descriptive statistics were used to analyze the results of the demographic and IWPS-R instruments. Frequencies and percentages were presented in narrative form and tables. The demographic questions 4 and 5 are nominal which is the lowest level involving the assignments of characteristics into categories (Polit, 2010). Job role and job location are unable to be ranked and one is not better than the other. Question 1,2,3, 6, and 7 are ordinal which measures rank such as highest level of education (Polit, 2010). The IWPS-R domains were entered into SPSS as a scale measurement. A Pearson correlation coefficient was used to identify the significance and direction of a relationship between two variables (Polit, 2010). Internal consistency of the IWPS-R instrument was analyzed, using Cox guidelines resources for data analysis (Cox et al., 2010) (see table 3). The p value was set at  $< 0.05$ . According to Polit (201), analysis of variance (ANOVA) was used for testing three or more

groups by comparing variability within the groups. This was important to run to understand the relationships between independent variables; manager support, peer support, unit support, workload to the dependent variable intent to stay. Lastly, a thematic analysis was performed on open-ended questions.

### **Data Collection and Treatment Procedure/Protocol**

The planned time frame (See Appendix I) was carried out without any delays. This project lead focused on the following protocol:

- Obtained clinical site ORRQIRP approval 08/12/2020 (See Appendix J)
- Obtained Regis University IRB approval 08/14/2020 (See Appendix K)
- Clinical site approval was obtained (See Appendix L)
- Obtained written approval to use the IWPS-R survey and to modify the demographics 07/1/2020
- Provided five educational sessions and multiple rounding to encourage survey participation
- Informational email was sent to the nurses that also served as an enrollment letter.
- Demographics, IWPS-R instrument and five open-ended questions were entered into the Redcap database system
- The survey opened for participation for three weeks in October 2020
- Raw data was uploaded from the Redcap system to an Excel spreadsheet, and then into SPSS 26.
- The results of this QI project will be shared with site of practice after final Defense.

### **Protection of Human Rights**

It is the responsibility of this project lead to ensure human rights protection is maintained. This project lead took a CITI training course (See Appendix M). Regis University Institutional Review Board (IRB) approval was obtained, and clinical site approval was obtained by the organizational process for QI projects through ORRQIRP. Both were deemed not to be research and allowed this project lead to proceed as a quality improvement project. An enrollment script was provided to survey participants (Refer to Appendix D). This enrollment script provided education about the survey, and informed consent was through participation completing the survey. The QI project lead ensured confidentiality and anonymity of the participants. Risks are

minimal to none. Participation or non-participation does not impact employment. De-identified aggregate data was collected and will be stored in a secure password protected database for three years following the end of the project. There was no protected health information used in this study. The benefit of this study for the participants was to provide the opportunity for input for future planning of an improved scheduling program.

### **Project Findings and Results**

Nonparametric testing in SPSS used a regression test and two split file ANOVA tests. These tests were performed to measure the relationships between the independent variables MS, PS, US, WL, and the dependent variable ITS, and to understand if there is a difference in perceptions of workload between nursing role and job location. An additional five-open ended questions were asked to obtain perception of workload in their own words. The following are the results of the three instruments used; demographics, the IWPS-R domains and the open -ended questions.

#### **Demographics**

A sample size of 50 nurses were invited to participate in the online survey. A total of 44 nurses completed the survey which was an 88% response rate. Refer to Table 6 for demographic frequencies. Forty-seven percent of the participants are between the ages 22 and 38 years of age and the second largest group is 43% which are between the ages of 39 and 55 years of age. Nurses with their bachelor's degree is high at 88.8% which directly correlates to the organizations' requirement upon employment. Four and a half percent of participants have their associate's degree and have been "grand fathered in" once that decision was made in this organization. Fifty-two percent of the participants have their pediatric hematology oncology certification with a total of 79.6% overall certification. There are 20.5% of nurses not certified.

Of the 88% participants 19 were infusion nurses or 43.2%. Sixteen were nurse care coordinators or 36.4%, and nine or 20.5% of nurses who participated perform their job in both roles. The larger campus had the most participants at 68.2% who took the survey, and 31% of nurses participated who work in the network of care. The majority of the nurses have been in their role between six or more years and the majority of the nurses are fulltime at 65.9%.

**Table 6**

*Demographics of Participants (n=44)*

	Number	Percent
<b>Year Born/Ordinal</b>		
1950-1964	4	9.1
1965-1981	19	43.2
1982-1998	21	47.7
<b>Highest Degree Obtained/Ordinal</b>		
Associates Degree	2	4.5
Bachelor's Degree	39	88.6
Master's Degree	1	2.3
Doctorate Degree	1	2.3
<b>Nursing Certification/Ordinal</b>		
CPN	2	4.5
CPON	5	11.4
CPHON	23	52.3
Other	5	11.4
Not Certified	9	20.5
<b>Job Role/ Nominal</b>		
Infusion Nurse	19	43.2
Nurse Care Coordinator	16	36.4
Both Roles	9	20.5
<b>Job Location/Nominal</b>		
A	30	68.2
B	14	31
<b>Years in Role/Ordinal</b>		
<1	3	6.8
1-5	19	43.2
6-10	11	25
11-15	7	15.9
>15	4	9.1
<b>Employment Status/Ordinal</b>		
Fulltime	19	65.9
Part-time	14	31.8
Flex	1	2.3

Note: CPON= Certified Pediatric Nurse, CPON=Certified Pediatric Oncology Nurse, CPHON-Certified Pediatric Hematology Oncology nurse.

### **Analysis of the Data Based on QI Project Objectives**

This project lead defined three objectives to analyze the data. The first was to analyze the quantitative data to gain an understanding of nurses' perception of workload and overall job satisfaction. This objective was met by performing a Regression Test, a Pearson Correlation table, and the IWPS-R descriptive statistics, frequencies, and percentages of the subscales. The second objective was to use the demographic data to understand any differences in workload perception between the infusion nurse and the nurse care coordinators. In addition, if there was a difference in perception of workload between the network of care site and the larger infusion center. This objective was met by performing two split file ANOVA tests. The third objective was to identify themes of workload perception by asking the nurses the five-open ended questions. The following are the results.

#### **Regression Test: Model Summary and Coefficients**

Polit (2010) describes regression as a statistical model that predicts values of a dependent variable to the values of one or more independent variables. Polit also describes that R Square indicates there is a proportion of variance in the dependent variable that can be explained by the independent variables (Polit, 2010). R Square is a percentage that explains how much of the independent variables impact the dependent variable intent to stay. Table 7 shows three out of the four independent variables have an impact with the dependent variable intent to stay: PS, US, and WL. MS did not have an impact on with intent to stay.



**Table 7.***Regression: Model Summary and Coefficients*

Model Summary	P=value
R Square .362	
Manager Support	.078
Peer Support	.000
Unit Support	.008
Workload	.000

**Pearson Correlation: Demographics and IWPS-R**

To meet the second objective, a Pearson Correlation table was run. According to Polit (2010), a correlation coefficient summarizes the relationship between two variables. Pearson correlation coefficient statistics provided correlations between the demographics and the IWPS-R subscale domains. Table 8 shows five correlations with statistical significance with a p-value of  $< 0.05$ . The correlation between employment status and nurse satisfaction has a moderate positive correlation ( $p=.002$ ). There is a significance with workload and intent to stay ( $p=.000$ ) as well as workload and nursing satisfaction ( $p=.000$ ). This suggests that their workload is not affecting their job satisfaction. There was also an inverse correlation between nursing certification and years in role, suggesting that the number of years in role does not make a difference with certification status. Perhaps the number of younger nurses that have their certification is higher than older nurses.

**Table 8***Pearson Correlation demographics and subscale domains*

Variable	Variable	Correlation Coefficient	p-value	Low Moderate High	Positive or Negative
Nursing Certification	Years in Role	-0.420	.005	Moderate	Negative
Employment Status	Nurse Satisfaction	0.451	.002	Moderate	Positive
Workload	Intent to Stay	0.448	.000	Moderate	Positive
Workload	Nurse Satisfaction	0.235	.000	Low	Positive
Intent to Stay	Nurse Satisfaction	0.330	.000	Moderate	Positive

**Descriptive Statistics: Frequencies and Percentages**

Descriptive statistics frequencies were run to compare percentages of IWPS-R questions. The definitions of the IWPS-R subscales are found in Table 9. A Cronbach's Alpha was performed for each domains MS, PS, US, WL, ITS and NS to test internal consistency. Nurse satisfaction contains all 29 survey questions which shows an internal consistency of .93.

Refer to Table 9 to view results of the IWPS-R survey. Findings of each domain are discussed in the next several paragraphs of this paper.

**Manager Support.** There are eight questions in the survey that directly relate to manager support. Fifty-eight percent of participants agree or have the perception that their supervisors are helpful and concerned about their needs and 21.1% strongly agree of this same perception. However, 23.1% were not sure, disagreed and strongly disagreed. Overall, the responses reflect that there is manager support.

**Peer Support.** There are six questions in the survey that directly relate to peer support. Forty-eight percent strongly agree that the relationship that nurses have with each other is strong

and 43.6% agree. Eight percent of participants were unsure, disagreed or strongly disagreed. Overall, the responses reflect that there is a strong sense of peer support among the participants.

***Unit Support.*** Six questions in the survey relate to unit support. Again, a very positive response that nurses feel they have the resources to do their job. Fifty-eight percent agree that they have unit support and an additional 31% strongly agree that they have unit support.

***Workload.*** There are six questions related to workload. As noted, 53.4% of the responses agree they do not feel that pressure and urgency dominate the work environment. An additional 22% strongly agree they do not feel that pressure and urgency dominate the work environment.

***Intent to stay.*** Intent to stay is measured by five questions. Forty-three percent of responses indicate the likelihood that nurses intend to stay in the next year is high. An additional 38.2% strongly agree which indicates an intent to stay.

***Nurse Satisfaction.*** Nurse satisfaction takes in to account the entire 29 questions. There are 51.2% of responses agree that there is job satisfaction and 31.6% strongly agreed there is satisfaction in their job. There are only 17.1 % responses that indicate they are unsure, disagree, and strongly disagree in job satisfaction.

***Summary.*** Nurses feel that they are supported by their manager, peers, they have the resources to do their job, and their workload does not cause pressure or urgency in their work environment. In addition, their work environment does not cause them to want to leave, and they are overall satisfied in their job.

**Table 9**

*Frequencies and percentages by domain: manager support, peer support, unit support, workload, intent to stay, and nurse satisfaction*

Subscale (Number of questions)	Number	Percentage
<b>Manager Support (8)</b>		
Strongly Disagree	3	1
Disagree	31	10.1
Unsure	37	12
Agree	172	55.8
Strongly Agree	65	21.1
<b>Peer Support (6)</b>		
Strongly Disagree	2	0.8
Disagree	9	3.4
Unsure	10	3.8
Agree	115	43.6
Strongly Agree	128	48.5
<b>Unit Support (6)</b>		
Strongly Disagree	2	1.9
Disagree	15	14
Unsure	12	8.7
Agree	123	53.4
Strongly Agree	82	22
<b>Workload (6)</b>		
Strongly Disagree	5	1.9
Disagree	37	14
Unsure	23	8.7
Agree	141	53.4
Strongly Agree	58	22
<b>Intent to Stay (5)</b>		
Strongly Disagree	7	3.2
Disagree	10	4.5
Unsure	24	10.9
Agree	95	43.2
Strongly Agree	84	38.2
<b>Nurse Satisfaction (29)</b>		
Strongly Disagree	19	1.4
Disagree	102	7.7
Unsure	106	8
Agree	676	51.2
Strongly Agree	417	31.6

### **Analysis of Variance**

According to Polit (2010), analysis of variance (ANOVA) is used for testing three or more groups by comparing variability within the groups. The desire to know if nurses' perceptions of workload were different between locations and job roles required an ANOVA split file to be run to compare the groups. The split file ANOVA test looked at manager support, peer support, unit support, workload, and intent to stay by location. At the larger campus infusion center, unit support was more significant, indicating that these nurses felt they had the tools and supplies needed to do their job ( $F=3.353, p .025$ ). Another split file ANOVA was run to understand if there was a difference in nurses' perception of nurse satisfaction by workload between job roles (Infusion Nurse, Nurse Care Coordinator, both roles). There was no statistical significance in nurse satisfaction by workload between roles.

### **Open Ended Questions**

In addition to the descriptive statistics data collected, there were five open-ended questions included at the end of the quantitative survey. The following is an analysis of these questions. See Appendix N for other examples of participant responses.

#### ***Question 1: Describe what makes your workday a perfect day?***

There were four emerging themes: a decent schedule, teamwork, teamwork and a decent schedule, and adequate staffing. There were 43 comments answered to this question. Of the 43 there were 18 comments related to a decent schedule of patients throughout the day would make their day a perfect day. The overall arching theme to these comments were related to an adequate patient schedule. "Balance of patients in clinic and completing other tasks for patient care," and "Scheduling that isn't overcrowded, allowing time for tasks, teaching, personal care of patient" were common. In addition, comments about being overwhelmed due to the balancing of

patients at a given time during the day. "I like to be busy but not frazzled, I like when patients are evenly spaced on the schedule, with adequate time to initiate care."

There were 19 comments that stated teamwork makes their day a perfect day. Comments such as "having a positive attitude throughout the team," "everyone doing their part," "my wonderful co-workers and being able to make a difference in a patient's day and maybe add a little humor to their situation," and "smooth communication and teamwork."

There were two comments that included a decent schedule and teamwork. One comment that stood out, "Coworkers being positive, helpful, and respectful; manager being empathetic and supportive, minimal interruptions to my work; feeling like I have time and space to connect well with patients." This indicates they are impacted by how patients are scheduled.

Being staffed appropriately rounded out the comments with three simple statements such as "staffed appropriately," "adequate staffing to allow for a less stressful day," and "smooth and safe staffing."

***Question 2: Describe what makes your workday the worst day?***

There were four emerging themes from this question: scheduling, teamwork, adequate staffing, and unhappy patients and or families. There were 43 comments answered to these questions. There were 21 comments describing scheduling as a contributing factor to their worst day. Many of these comments begin with, ... "several patients being scheduled at the same time," "too many patients all at once," "when visits are stacked on top of each other," and when "too many patients all scheduled within a 2–3-hour time frame."

There were 11 comments describing the impact of teamwork to their worst day. Many comments such as "negativity of co-workers," "when I have a busy assignment with no support from my co-workers," "gossip," "team members," "unhelpful co-workers," and "not having help

for tasks.” Additional comments that impact teamwork were things that were unexpected. “The worst days are ones when nothing goes right.” “The lab is slow with results or the pharmacy is slow with delivering meds, or an IV start takes forever, a kid is super sick.”

There were five comments related to adequate staffing. Themes such as “unexpected delays, not enough staff,” “short-staffed with infusion reactions,” and “Being overwhelmed or unsafe with patients due to low staffing.”

There were six comments with the theme of unhappy patients and families impacting their worst workday. “Feeling unsafe or incompetent, negative interactions with staff, families or patient,” “Difficult patients/parents,” “recurrent cancer,” “Having patients and families that are difficult and mean,” and “when families get upset about something that is out of my control.”

***Question 3: Describe what effects your workload during your workday?***

Scheduling continues to be a major theme. With this question scheduling issues and patients with more needs emerged. There were overwhelmingly 36 comments related to scheduling. There were many comments that tied to scheduling of patients with not having enough space. “Not having enough rooms for every patient scheduled in the morning,” “SPACE!!” “We do not have enough space for the amount of patients that are being scheduled on a daily basis,” and “timing and spacing of patients.” Other comments made that affect their workday are related to patients added on to the schedule, unexpected sick patients. Comments such as “add on patients,” “unexpected patient needs,” “patients showing up late,” and “unexpected relapses.” Continued themes from questions one and two are observed such as “Being double booked, triple or even quadruple scheduled in a given time slot,” and “Number of patients on my schedule, distribution of patients, not having all my patients clumped in time.”

***Question 4: Describe what takes the most time during your workday?***

Additional tasks that need to be completed along with patient visit or outside the patient visit. There were 21 comments with this theme. These are things such as teaching families, charting, care coordination, stocking and ordering supplies. Two comments; “Catching up on charting because the morning is so busy, I don’t have time to chart,” and “Stocking, ordering linens, checking expiration dates.” Being able to get a hold of providers both oncology and non-oncology providers was mentioned. Two comments specific to this are “trying to reach ancillary providers when there are unknowns with their patients,” “tracking down providers to find answers to questions/especially ancillary patients.”

There were 16 comments with the theme of patient care or family issues that took the most time in their workday. The majority of the comments were made simply about patient care in itself. “Caring for and charting on many patients.” Additional comments were about the acuity of the patient. “High acuity social needs,” “emotional/social issues with patients,” and “unexpected sick patient in clinic or at home.”

There were three comments that they were unsure what takes the most time during their workday.

***Question 5: Is there anything else you would like us to know?***

This question was asked to give participants the opportunity to add any information that may have been missed in the previous questions that they would want leadership to know. Twenty-four participants responded no or not at this time. There were six questions that had a theme of workload or scheduling. “The flow in the clinic would be much smoother, if we did not bunch all of the visits in the morning,” and “If we had 20-30 rooms available, our day would feel so much more manageable.”



There were three comments related to the work of the MA. "Not having an MA consistently to fulfill all their job duties, doing the RN job and the MA job can be cumbersome," and "MA's can make or break our flow."

There were four comments that were positive toward the place they work. "CCBD is a great place to work," "Please keep communicating," "I really value our leadership," "I really appreciate all of you," "We have a great work environment," and "Thank you for your continued support."

### ***Open-ended Questions Summary***

In summary, there was great participation in answering these five questions. Two overarching themes emerged throughout the comments. The first being scheduling of the patients can either make their day a best day if they are evenly spaced out throughout the day. However, and more common throughout the comments it can make their day a worst day if all the patients come at once. Teamwork is the second large theme and can be said in the same way that great teamwork can make their day the best, however, poor teamwork can make their day worse.

### **Limitations, Recommendations, and Implications for Change**

One primary limitation of this study is a small sample size. This study was limited to one large system infusion center with only ( $n=44$ ) and not a sample of a population representation. The second limitation is that the sample size included three job roles the infusion nurse, the nurse care coordinator and the nurse who performs both roles. While there was not a significant finding with job roles, a nurse that performs both could have skewed the data either way.

Additional studies with similar organizations and processes could be of benefit in understanding pediatric nurses' perception of workload in infusion centers. A second

recommendation is to provide nurses at this organization the opportunity to take this survey again after an acuity-based schedule is implemented.

While the quantitative data showed that nurses are overall satisfied in their jobs the five open-ended questions highlighted that the scheduling of patients does impact their workday and there is a need for the development and implementation of an acuity-based scheduling system. The most significant implication is that the nurses' voices have been heard and will drive change with their work environment.

### **Summary**

The complexities of scheduling pediatric patients in the outpatient infusion setting will continue to grow as the increase of high acuity medications are given. Understanding the nurses' perception of their workload through this analysis was key to moving forward with creating an acuity-based scheduling system. This study showed statistical relationships between workload, intent to stay and job satisfaction. The open-ended questions did answer the PICO question that the perceptions of the nurses' workload is impacted by the way patients are scheduled throughout the day. It will be key to improve the way patients are scheduled to continue to have a highly engaged team and to maintain job satisfaction.

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## Appendix A

## Systematic Review of Evidence Examples

Article Title and Journal	Acuity-based nurse assignment and patient scheduling oncology clinics. <i>Healthcare Management Science</i> . 19 2017-226.	Acuity-Based Scheduling Outcomes in ambulatory oncology centers. <i>Clinical Journal of Oncology Nursing</i> , 21 (2). 250-253.
Author/Year	Liang, B., Turkcan, A. (2016).	Edwards, L., Hermis, K., LeGette, C., R., Lujan, L., A., & Scarlett, C. (2017).
Database and Keywords	CINHAL, with full text, MEDLINE, Academic Search Premier, Google Scholar Acuity-based scheduling, pediatrics, infusion center, oncology clinic, acuity-based staffing, nurse workload, chemotherapy, outpatient	CINHAL, with full text, MEDLINE, Academic Search Premier, Google Scholar Acuity-based scheduling, pediatrics, infusion center, oncology clinic, acuity-based staffing, nurse workload, chemotherapy, outpatient
Research Design	Descriptive Computational study using 2 care delivery models/Quality Improvement	Quality improvement Control group without randomization
Level of Evidence	VI	III
Study Aim/Purpose	Focus on functional and primary care delivery models to reduce the time spent for nurse assignment and patient scheduling. To determine the optimal number of nurses with objective of minimizing patient waiting times, minimize overtime, and excess workload.	The aim of this study was to build and evaluate an ABS that focused on scheduling patients by infusion chair and time and nurse acuity. Pre and post data showed improvement with level loading. Level loading was improved and increase nurse satisfaction.
Population Studied/Sample Size/Criteria/Power	Patients that are only scheduled in the Infusion Center, exclusions are patients receiving laboratory tests and or seen in clinic by oncologist.	Infusion patient's receiving their infusions at one of Texas MD Anderson Regional Cancer Centers.
Methods/Study Appraisal/Synthesis Methods	Multi-objective optimization model for nurse assignments minimizing patient waiting times. Functional care delivery model and primary care delivery model. This model assigns nurses to patients and determines actual start times of the patients. Model focus is, appointment times, treatment duration, acuity levels, nurse work schedules, skill levels and max acuity level a nurse can handle at any given slot	Utilization of templates built, clinical space re-designed and staffing according to patient acuity levels. A six- level acuity template was designed and used. Two scheduling templates were built for higher and lower acuity patients. Shorter infusion patients were shifted to the additional room designed.
Primary Outcome Measures and Results	Functional care delivery algorithm finds more nondominated solutions when number of nurses is small. As number of nurses increase the nondominated solutions decrease due to overall decrease in overtime and waiting times. This model may not work when volumes are high and nurse capacity is not enough. Primary care model: when excess workload allowance is increased, more nondominated solutions can be found. As the number of nurses increases, the number of problems decreases. The excess workload allowance also reduces the number of problems.	The six acuity level templates have been operationalized. All metrics showed an improvement in efficiency. Patient satisfaction improved.

<b>Author Conclusions/ Implications of Key Findings</b>	Two different care delivery models were considered which consider patient acuities, nurse skill, max acuity, nurse worked hours. The functional care delivery model finds less solutions to the problem than the primary care delivery model. It finds solutions with less total overtime due to flexibility of assigning patients to any of the nurses. The primary care delivery model can find more solutions due to multiple alternative appt. schedules, the nurse can manager their own schedules. But requires a method to determine primary nurse for each patient. Nurse managers can choose one of these models that best fit the practice of their clinic.	Scheduling by acuity does increase overall efficiency of the work- flow in this center maximizing capacity. In addition, increased staff, patient, and provider satisfaction.
<b>Strengths/ Limitations</b>	Strengths: This study is the first that contributes to solving nurse assignments problem for a given patient mix and appointment schedule in outpatient setting. The first study to consider a primary care delivery model in oncology clinics. Limitations: It did not compare 2 models; more research will be needed to see which one is the most optimal.	Baseline data used to compare pre-and post - implementation. No pre -data for level 2 type template as they could not extrapolate that data.
<b>Funding Source</b>	<b>None identified.</b>	<b>None Identified.</b>
<b>Comments</b>	This study did include acuity but not clear on how they developed an acuity of 1 through 3. Will need more research specific to building and outpatient acuity tool.	Shows a positive impact on acuity-based scheduling. It does not mention if the acuity-based-scheduling happens in the EHR.

Systematic Review Evidence Table Format [adapted with permission from Thompson, C. (2011). Sample evidence table format for a systematic review. In J. Houser & K. S. Oman (Eds.), Evidence-based practice: An implementation guide for healthcare organizations (p. 155). Sudbury, MA: Jones and Bartlett.]



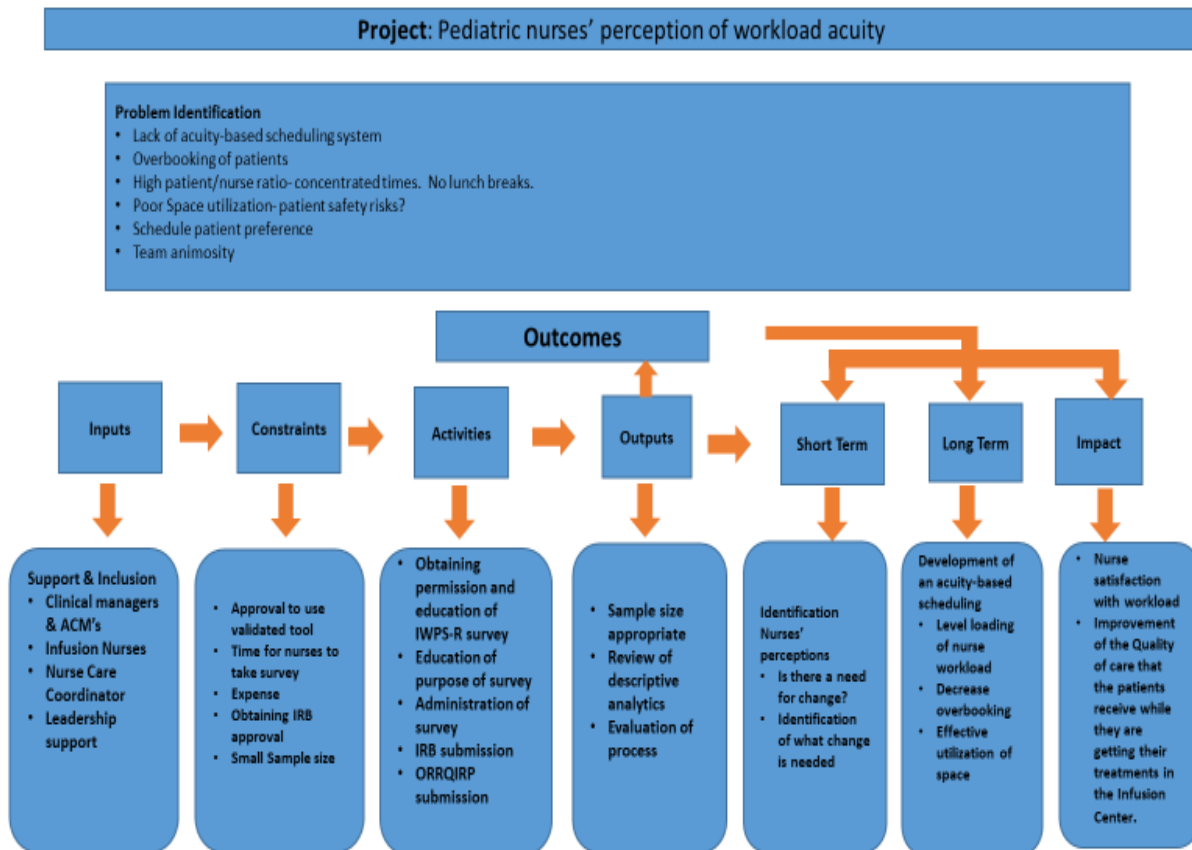
## Appendix B

## Budget and Resources

Resources	Cost	Total	Actual Cost to PI to Conduct Project	Cost to Replicate
Use of computers (paperless, computers readily available)	\$0	\$0	\$0	\$0
Use of an online platform Redcap	\$0 (will have availability through CHCO)		\$0	\$0
Implementation of the project	100 hours at \$60.00/hour	\$6,000.00	\$0	\$6,000.00
Recruitment of participants	3 emails (5 minutes per email) \$12.00 x3=\$36.00 3 Staff meetings (10 min/mtg)) \$18.00x3=\$54.00	\$90.00		\$90.00
Consultation with clinical mentor	20 thirty-minute meetings with mentor at \$60.00/hr.= \$600.00	\$600.00	\$0	\$600.00
Consultation with clinical chair	5 one-hour meetings at \$60.00/hr. = \$300/hr.	\$300.00	\$0	\$300.00
IBM SPSS software recommended for IWPS-R analysis	\$ 99.00/month x 6 months=\$594.00	\$594.00	\$594.00	
Consult with nursing analyst	3 one-hour meetings at \$50.00/hr.= \$150.00	\$150.00		\$150.00
	Project Budget	\$8,328.00	\$594.00	\$7,140

## Appendix C

## Logic Model



## Appendix D

## Enrollment Script

Dear CCBD Infusion Nurses and Nurse Care Coordinators,

I am currently a DNP student at Regis University. I am conducting a quality improvement project (QI) which is required for my degree. My project titled: *Pediatric Nurses' Perception of Workload in a Large System Infusion Center* is seeking to understand your perceptions of your current workload.

Within the CCBD the complexity of managing a schedule that includes provider, infusion, care coordination, patient request and chair availability is a daily challenge. Ultimately this affects the nurses' workload, care delivery and satisfaction. This QI project is an opportunity to understand perceptions that you have of your current workload. Your opinion is valuable, and this information will be the foundation of how we move forward with working on better workflows that will increase nurse satisfaction with workload.

You are being asked to participate in an online survey, the *Individual Workload Perception Scale - Revised (IWPS-R)*. The IWPS-R is a 29-item Likert scale instrument. This scale seeks to identify key factors connected to the nurse's daily workload, which include: *Manager Support, Peer Support, Unit Support, and Workload*. These influencing factors seek to measure *Intent to stay* related to nurses' perception of workload. All scores are then combined to achieve an *Overall Nursing Satisfaction score*. As you complete the IWPS-R, read each question, and choose one answer that best describes your work.

In addition to the IWPS-R, there is a short series of general demographic questions. And finally, there are five open ended questions that will give you an opportunity to provide feedback on your current workload in your own words. It will take you about 20 to 30 minutes to complete both the Demographic Information Form and the IWPS-R and the open-ended questions.

Your participation in this survey is voluntary. There will be no consequences if you choose not to take this survey or choose not to complete it once you begin. No personal identifiers are used on any of the survey tools. All information will remain confidential and remain in a secure data base. Your submission of the survey (IWPS-R, demographic questions, open-ended questions) indicates your consent to participate in this quality improvement project.

I appreciate your time and consideration. Please feel free to contact me if you have any questions about this quality improvement project.

Thank you,



Karen Walton MS, RN, CPON, DNPc, Regis University  
Office Phone: (720) 777-8160/ Cell Phone: 720-810-9349

## Appendix E

## Demographics

**Demographics**

**Please circle your answer.**

**1 Year Born:**

- 1= 1950-1964
- 2= 1965-1981
- 3= 1982-1998
- 4= 1999-present

**2. Highest Degree Obtained**

- 1= Diploma
- 2= Associates Degree
- 3= Bachelors' Degree
- 4= Masters' Degree
- 5= Doctoral Degree

**2. Nursing Certification**

- 1= CPN
- 2= CPON
- 3= CPHON
- 4= other \_\_\_\_\_
- 5= Not certified

**4. Job Role**

- 1= Infusion Nurse
- 2= Nurse Care Coordinator
- 3= Work in both roles

**5. Years in your current Role**

- 1= < 1
- 2= 1-5
- 3= 6-10
- 4= 11-15
- 5= > 15

**6. Years at CHCO**

- 1= < 1
- 2= 1-5
- 3= 6-10
- 4= 11-15
- 5= > 15

**7. Employment Status:**

- 1= Full-time
- 2= Part-time
- 3= Flex

## Appendix F

## Written Permission for IWPS-R Use

Karen,

Thank you for your time today to discuss the Individual Workload Perception Scale - Revised (IWPS-R) tool. You have permission to use the IWPS-R for your graduate work. Please provide me verification of your local IRB approval before the administration of the survey.

Good luck.

Sue

**Susan Teasley, MBA, MSN, RN, NE-BC, CCRC | Program Director**

Patient Care Services Research

Children's Mercy Kansas City

P: (816) 701-4551 (ext. 44551) | F: (816) 701-5295 | Cell: (816) 550-8541

E: [steasley@cmh.edu](mailto:steasley@cmh.edu) | W: [childrensmercy.org](http://childrensmercy.org)

2401 Gillham Road | Kansas City, MO 64108

Permission to personalize the demographics information is granted within the IWPS-R user guidelines manual (Cox et al., 2010).

## Appendix G

## IWPS-R Tool

**INDIVIDUAL WORKLOAD PERCEPTION SCALE - REVISED**

**THINK ABOUT YOUR TYPICAL DAILY WORKLOAD OVER THE PAST SIX MONTHS AND ANSWER THE FOLLOWING QUESTIONS.**

<b>Scale:</b>		<b>1 = Strongly Disagree</b>	<b>2 = Disagree</b>	<b>3 = Unsure</b>	<b>4 = Agree</b>	<b>5 = Strongly Agree</b>
1.	If the nurse manager is off duty the unit is encouraged to contact her/him when there are staffing difficulties	1	2	3	4	5
2.	I am able to take at least a 30 minute meal break during my shift	1	2	3	4	5
3.	Individual assignments are fairly distributed within the unit given the available resources	1	2	3	4	5
4.	Most days I feel my workload is reasonable	1	2	3	4	5
5.	If I complain about my workload to the nurse manager she/he will be empathetic	1	2	3	4	5
6.	Equipment (blood pressure machines, sat monitors, scales, lifts, wheelchairs, thermometers) for patient care is available when I need it for patient care	1	2	3	4	5
7.	I work with nurses who I respect professionally	1	2	3	4	5
8.	When I feel overwhelmed I can count on other nurses to help me	1	2	3	4	5
9.	I stay in my current position because of the support of my nurse manager	1	2	3	4	5
10.	Social workers are available as needed by the patients I care for	1	2	3	4	5
11.	My current workload will cause me to look for a new position	1	2	3	4	5
12.	When a patient experiences a major crisis (code blue, new life-threatening diagnosis) or dies a chaplain is available to support the patient and/or their family.	1	2	3	4	5
13.	I do not plan to stay in my current position for the next 12 months	1	2	3	4	5
14.	The nurse manager assists in working with patients and families who are unhappy with their care	1	2	3	4	5
15.	The nurses on my unit are a team	1	2	3	4	5
16.	The nurses I work with are competent in caring for our typical patient population	1	2	3	4	5
17.	I plan to stay in my current position for at least the next 12 months	1	2	3	4	5
18.	Supplies (IV supplies, catheters, dressings, syringes, linens) for patient care are available when I need them	1	2	3	4	5
19.	Pharmacy services provide adequate support in the medication process	1	2	3	4	5

Appendix H

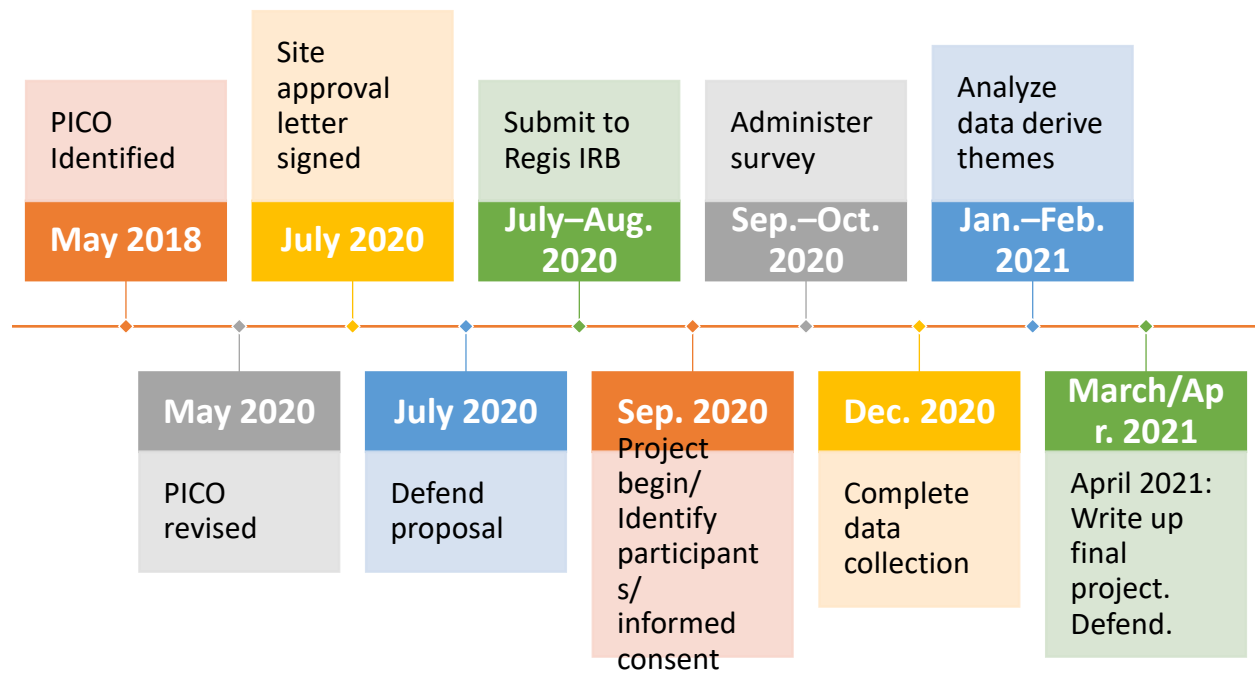
Open-Ended Questions

Please answer the following questions as it relates to your workday.

1. Describe what makes your workday a perfect day?
2. Describe what makes your workday the worst day?
3. Describe what affects your workload during your workday?
4. Describe what takes the most time during your workday?
5. Is there anything else you would like us to know?

## Appendix I

## Project Timeline





## Appendix J

## Site Approval ORRQIRP

**Approval Date:** 8/12/2020

**Title:** Pediatric Nurses' Perception of Workload in a Large System Infusion Center

**QI #:** 2008-1 (click the QI # to review your original ORRQIRP application)

Dear Project Lead,

ORRQIRP reviewed the above-titled project on 8/12/2020 and determined that it qualifies as "non-human subjects research". Consequently, any findings of this project should not be presented as research as defined by 45 CFR 46.102 (d).

Your project is approved for a one-year period ending 8/12/2021. If you decide to change the purpose of your project, you will need to amend your application and ORRQIRP will review it.

Your project will need to be renewed prior to the expiration date. You will receive a reminder letter for annual renewal.

If you have any questions or concerns, please contact Hannah Gilbert at [Hannah.Gilbert@childrenscolorado.org](mailto:Hannah.Gilbert@childrenscolorado.org).

Sincerely,

Hannah Gilbert, MS, CCRP

ORRQIRP Chair

## Appendix K

## Regis University IRB Approval Letter

- **From:** Alan Stark <[no-reply@irbnet.org](mailto:no-reply@irbnet.org)>  
**Sent:** Friday, August 14, 2020 3:45 PM  
**To:** Whalen, Kathleen S. (Faculty) <[kwhalen@regis.edu](mailto:kwhalen@regis.edu)>; Walton, Karen S <[walto860@regis.edu](mailto:walto860@regis.edu)>  
**Subject:** IRBNet Board Document Published
- Please note that Regis University Human Subjects IRB has published the following Board Document on IRBNet:  
Project Title: [1635570-1] Pediatric Nurses' Perception of Workload in a Large System Infusion Center  
Principal Investigator: Karen Walton, MS

Submission Type: New Project  
Date Submitted: August 14, 2020

Document Type: Not Research Letter  
Document Description: Not Research Letter  
Publish Date: August 14, 2020

Should you have any questions you may contact Alan Stark at [astark@regis.edu](mailto:astark@regis.edu).

Thank you,  
The IRBNet Support Team

[https://linkprotect.cudasvc.com/url?a=https%3a%2f%2fwww.irbnet.org&c=E,1,-ksSK7QNGpm5LE9vwis0bSx8UsKyMswgXz8jrfaIOISLZ9-y6wcAUQRArzWrMRnSqVaqK8bY\\_RiezYoNxES6t9xrBGxAu6e6UDMFBrLq87feU&typo=1](https://linkprotect.cudasvc.com/url?a=https%3a%2f%2fwww.irbnet.org&c=E,1,-ksSK7QNGpm5LE9vwis0bSx8UsKyMswgXz8jrfaIOISLZ9-y6wcAUQRArzWrMRnSqVaqK8bY_RiezYoNxES6t9xrBGxAu6e6UDMFBrLq87feU&typo=1)

## Appendix L

## Clinical Site Approval Letter

**Letter of Agreement**

**July 23, 2020**

To Regis University Institutional Review Board (IRB):

I am familiar with Karen Walton's quality improvement project entitled *Pediatric Nurses' Perception of Workload in a Large System Infusion Center*. I understand Children's Hospital Colorado involvement to allow Center for Cancer and Blood Disorder's infusion nurses and nurse care coordinators to complete a survey, and to allow this data to be collected, analyzed, and shared to drive further improvement of nurses' workload and overall job satisfaction.

I understand that this quality improvement project will be carried out following sound ethical principles and provides confidentiality of project data, as described in the proposal.

Therefore, as a representative of Children's Hospital Colorado, I agree that Karen Walton's quality improvement project may be conducted at our agency/institution.

Sincerely,

A handwritten signature in blue ink, appearing to read "Pat Givens".

Pat Givens, DHA, EdM, RN, NEA-BC  
Senior Vice President, Chief Nursing Executive & Dr. Dori Biester Chair in Pediatric Nursing  
13123 East 16th Avenue, Box 020 | Aurora, CO 80045 |  
Phone: 720-777-6757 | Fax: 720-777-7267 | [Patricia.Givens@childrenscolorado.org](mailto:Patricia.Givens@childrenscolorado.org)



Anschutz Medical Campus • 13123 East 16th Avenue, Aurora, CO 80045  
(720) 777-1234 (800) 624-6553




## Appendix M


## CITI Training

Fw: CITI Program - Course Completion for Karen Walton



Walton, Karen S <walto860@regis.edu>

To  Walton, Karen

 If there are problems with how this message is displayed, click here to view it in a web browser.



## Course Completion for Karen Walton

Congratulations on your recent course completion!

Name: **Karen Walton** (ID: 7911318)

Institution: **Regis University** (ID: 745)

Course: **Social Behavioral Research Investigators**

Stage: **1 - Basic Course**

Completion Date: **14 Feb 2019**

Expiration Date: **13 Feb 2022**

Completion Record ID: **30591353**

## Appendix N

Open-ended Question Themes Table

Question	Themes/responses
<b>What makes your day the best day?</b>	<b>Scheduling of patients/Teamwork/Adequate Staffing</b>
	<p><i>"Balance of patients in clinic and completing other tasks for patient care,"</i></p> <p><i>"Scheduling that isn't overcrowded, allowing time for tasks, teaching, personal care of patient"</i></p> <p><i>"I like to be busy but not frazzled, I like when patients are evenly spaced on the schedule, with adequate time to initiate care."</i></p> <p><i>"having a positive attitude throughout the team," "everyone doing their part,"</i></p> <p><i>"my wonderful co-workers and being able to make a difference in a patient's day and maybe add a little humor to their situation," and "smooth communication and teamwork."</i></p> <p><i>"staffed appropriately," "adequate staffing to allow for a less stressful day,"</i></p>
<b>What makes your day the worst day?</b>	<b>Scheduling of patients/Teamwork/Adequate staffing/Unhappy patients and Families</b>
	<p><i>"several patients being scheduled at the same time," "too many patients all at once," "when visits are stacked on top of each other," and when "too many patients all scheduled within a 2–3-hour time frame."</i></p> <p><i>"negativity of co-workers," "when I have a busy assignment with no support from my co-workers," "gossip," "team members," "unhelpful co-workers,"</i></p> <p><i>"unexpected delays, not enough staff," "short-staffed with infusion reactions,"</i></p> <p><i>"Being overwhelmed or unsafe with patients due to low staffing."</i></p> <p><i>"Difficult patients/parents," "recurrent cancer,"</i></p> <p><i>"Having patients and families that are difficult and mean,"</i></p> <p><i>"when families get upset about something that is out of my control."</i></p>

<b>What effects your workload?</b>	<b>Unexpected scheduling issues/patients with more needs/Teamwork/Space</b>
	<p><i>"Not having enough rooms for every patient scheduled in the morning," "SPACE!!"</i></p> <p><i>"We do not have enough space for the amount of patients that are being scheduled on a daily basis," and "timing and spacing of patients."</i></p> <p><i>"unexpected patient needs," "patients showing up late," and "unexpected relapses."</i></p> <p><i>"Everyone doing their part, rooms available to keep the schedule going,"</i></p> <p><i>"amount of interruptions from other staff members or patient needs, mood of manager, mood of co-workers,"</i></p> <p><i>"whether or not we are able to have an MA makes a huge difference in our workload,"</i></p> <p><i>"The attitude of my team affects my workload as well as who is present that day and available."</i></p>
<b>What takes the most time?</b>	<b>Non-patient care tasks/patient care or family care issues/Teamwork</b>
	<p><i>"Catching up on charting because the morning is so busy, I don't have time to chart," and "Stocking, ordering linens, checking expiration dates."</i></p> <p><i>"tracking down providers to find answers to questions/especially ancillary patients."</i></p>
<b>Is there anything else you would like us to know?</b>	<b>Workload/Teamwork/Good place to work/MA duties</b>
	<p><i>"The flow in the clinic would be much smoother, if we did not bunch all of the visits in the morning," and "If we had 20-30 rooms available, our day would feel so much more manageable."</i></p> <p><i>"CCBD is a great place to work," "Please keep communicating," "I really value our leadership," "I really appreciate all of you," "We have a great work environment," and "Thank you for your continued support."</i></p>