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Impact of Wait Times, Perception of Care and Environment on Patient Satisfaction at Infusion Centers and Dialysis Centers

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Abstract

Waiting time is a significant component of patient satisfaction. Patient satisfaction is an increasingly important parameter in assessing the quality of care. Understanding the most important factors impacting overall satisfaction can help health care administrators and providers improve patient care. Numerous studies showed that there is a strong and negative relationship between wait times and patient satisfaction at ambulatory clinics, orthopedic clinics, endocrinology clinics or emergency rooms. However, patient satisfaction at infusion centers and dialysis centers has not been widely studied. This study aimed to investigate relationships between perceived waiting times, perception of care and environment and patient satisfaction at Geisinger Infusion Center and Davita Dialysis Centers in Philadelphia. The results from our data analysis will help us gain clarity into factors that affect patient satisfaction to recommend strategies to improve patient satisfaction and healthcare outcomes.

Keywords: Dialysis, patient satisfaction, patient waiting time

Introduction

Similar to other industries, the health care industry has evolved and will continue to change rapidly due to emerging new technologies and new healthcare policies. The health care system in the U.S is shifting from a conventional fee-for-service model to a value-based reimbursement model to encourage healthcare providers to deliver care of the highest quality at the lowest cost, improving the value of patient care (Ray et al, 2016). With this shift, patient experience is used as a crucial metric to measure payment systems for quality. In 2010, the government enacted the Affordable Care Act, in which patient satisfaction has an impact on payments to healthcare organizations (Berkowitz, 2010).

One of the most influential frameworks put together by the Institute of Medicine (IOM) for improving the U.S. health care system outlines six aims for healthcare to be effective, timely, efficient, equitable, patient-centered and safe. Among the goals that had been suggested, the one that caught the most attention was the aim for health care to be "patient-centered by providing care that is respectful of and responsive to individual patient preferences, needs and values and ensuring that patient values guide all clinical decisions" (IOM, 2001).

Patient satisfaction is an important indicator that "measures the extent to which a patient is content with the care which they received from their health care provider and the quality of care." (Prakash, 2010). It measures the patients' perceived quality of care and acts as a means of evaluation for health care providers by providing providers meaningful insights into various aspects of care. Ultimately, patient satisfaction measures how successful medical providers are.

To understand and measure patient satisfaction, surveys have been used widely to quantify the patient care experience (Farley, 2014). They are a meaningful tool used to recognize gaps and generate effective strategies for quality improvements in the healthcare industry. As the healthcare

industry moves toward patient-centered care, feedback from the patients' perspective is extremely valuable (Prakash, 2010). In our study, we will be using an anonymous patient survey as a tool to quantify the quality of care perceived by patients at infusion centers.

This study looked at self-reports of random, volunteer patients visiting infusion centers and dialysis centers regarding their perceptions of wait times and also assessed the impact of other factors such as their perceptions of the technical and interpersonal skills of the medical nurses who attended to them, as well as the environment of the center. We believe data from patient satisfaction surveys can provide feedback that guides healthcare organizations in policies and procedures to make patient experience better, thus increasing repeat patient visits and revenue growth to maintain competitive in the marketplace.

Numerous studies have shown that factors impacting patient satisfaction include wait time, communication, patient age, health status and length of time spent with the provider. These studies were conducted in various settings such as orthopedic clinics (Kreitz et al 2016), endocrinology outpatient departments (Xie et al 2017), emergency departments (Shen et al 2017), ambulatory care clinics (Bleustein et al 2014) and primary care clinics (Michael et al 2013). Although well studied in various clinical settings, no published literature studies were found for patient satisfaction at infusion centers. In our study, we analyze factors that are likely to impact patient satisfaction at infusion centers.

Many studies have shown that longer wait times have been associated with lower patient satisfaction. Kreitz et al (2016) studied how patient wait time relates to their level of satisfaction and the likelihood of recommending the orthopedic clinic to others. The study collected a total of 3125 and 3151 responses for satisfaction and likelihood to recommend the orthopedic clinic. They found that reduction in patient wait times in the orthopedic clinic improves patient satisfaction but

does not affect their likelihood of recommending the practice to others. Overall, while the paper addresses the relationship between patient wait times and overall satisfaction in the clinic, it does not evaluate other factors that might contribute to patient satisfaction. Another limitation is that the study only studied patients at one orthopedic clinic.

Xie et al (2017) conducted a study to analyze the associations between actual waiting time, perceived acceptability of waiting time, actual service time, perceived acceptability of service time, actual visit duration and patient satisfaction with endocrinology outpatients in a major (1700-bed) teaching hospital in China. The study used data from 49 patients who volunteered to participate in the survey. They found that patients who waited longer for their health care services considered their wait times as less acceptable. Also, spending a longer time receiving care also did not correlate with a more positive perception of the services received.

Numerous studies have also shown that patient wait times impact other factors that were indirectly related to patient satisfaction. A study by Bleustein et al (2014) analyzed not only the relationship between waiting time and patient satisfaction but also looked at how waiting time affects the perception of the quality of care and physician capabilities. Using data collected from a sample of 11,352 survey responses over one year across 44 ambulatory clinics within a large academic medical center, they found that patients' perceived quality of care, as well as their perception of the doctors' capability diminished with longer wait times.

Jaipaul et al (2003) conducted a cross-sectional survey between July 1990 to March 1995 to determine the relationships between age, self-reported health and satisfaction from 6,625 patients at 32 hospitals around a large Midwestern metropolitan area. The patients completed a survey with their overall satisfaction with 5 different aspects of care (physician care, nursing care, information provided, discharge instructions and coordination of care). After analyzing their data

from the surveys, they found that the scores for all five aspects of care initially increased until age 65 and then declined. In addition, they found that the relationship between age and satisfaction was changed by health status. In other words, the decreased satisfaction in older patients was less pronounced compared to age-matched patients with better health.

Another study by De Man et al (2005) studied the impact of wait times on the perception of service quality in nuclear medicine. Both objective and subjective waiting time data were collected from 406 patients undergoing nuclear medicine therapy. They concluded that the total waiting time and the waiting time before injection were overestimated by the patients while the waiting time before scanning was underestimated by the patients. They also found that offering reasons to patients for the delay has a significant impact on the perception of reliability of the nuclear medicine department.

In this study, we focus on analyzing how wait times and other factors such as medical staff's technical and interpersonal skills and the environment impact patient satisfaction at infusion center and dialysis centers in Philadelphia. We expected that long wait times and inefficiency in the delivery of care will result in patient dissatisfaction in the overall medical services received. Therefore, maximizing patient satisfaction and experience is an important goal for many healthcare organizations to increase revenue and maintain competitive in the marketplace.

Method

A paper-based, self-administered, anonymous questionnaire survey was conducted at one infusion center and two dialysis centers: the Geisinger Infusion Center, Knapper Clinic, Danville, PA; Davita Dialysis Center, Mount Carmel, PA; and Davita Dialysis Center, Selingsgrove, PA.

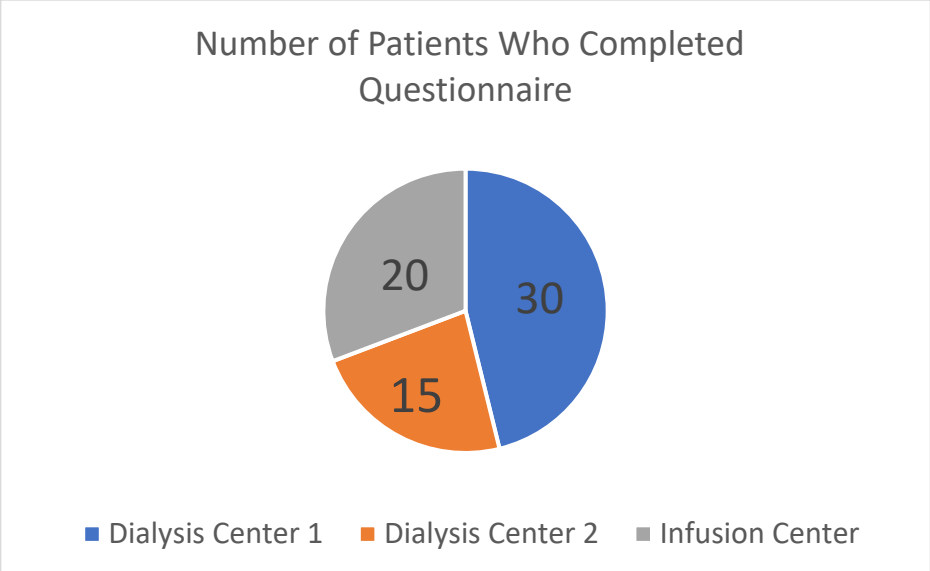
The survey questionnaire consisted of 11 multiple choice items which asked patients about their perceived wait times, rating regarding technical and interpersonal skills of the clinical staff who cared for the patient during their visit, ratings of the environment of the center, patient satisfaction, and willingness to recommend to family and friends. Over a period of three days, all patients who visited the infusion and dialysis centers were asked if they would like to participate in a short survey. 70% of the patients accepted the invitation to participate in the short survey. During the day of the survey, over a period of six hours, patients were asked to complete the questionnaire anonymously without assistance from the clinical staff. The survey questionnaire was simply handed out by the clinical staff at the centers to patients after their treatments. This included patients with appointments and without appointments. All patients' participation in the survey was completely voluntary.

Survey data were entered into Microsoft Excel and analyzed using pie charts, histograms and chi-squared tests. All data entries were double checked before performing the analysis. The study was approved by the Institutional Review Board of Harrisburg University of Science and Technology. No patient-specific identifiers were recorded during the study.

Results

We performed chi-square tests to analyze the differences in categorical data between the infusion center and both dialysis centers. The number of response categories for each question on the questionnaire varies between two and five. Before performing the chi-square test, the response categories were combined into two categories. The grouping of response categories is presented in the Appendix section Table 1. If the chi-squared tests have a $P < 0.05$, the differences in results between the infusion center and dialysis centers were considered statistically significant. We created pie charts and histograms to visualize and compare the data at all three centers. The graphs are presented in the results section of the paper.

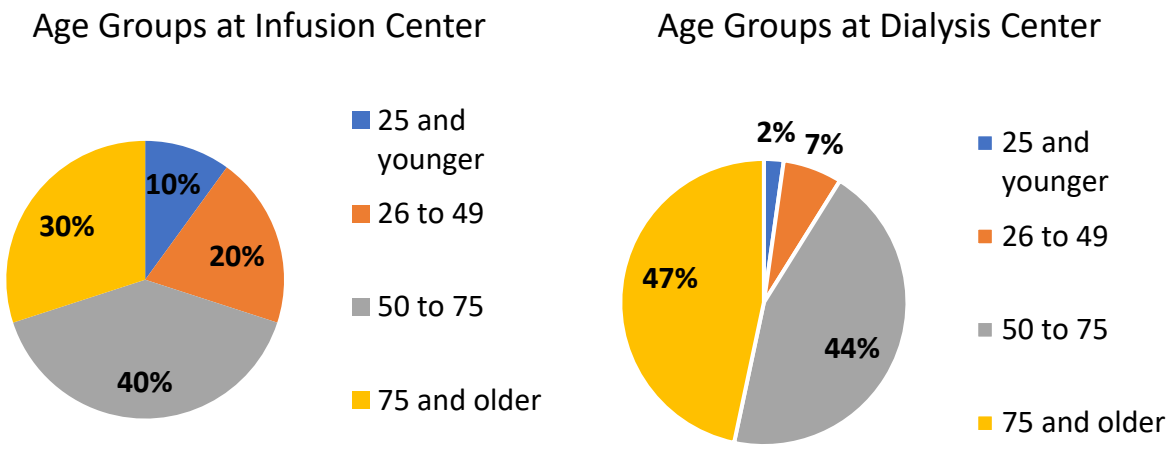
We collected questionnaires from a total of 20 patients from the infusion center and 45 patients from the dialysis center. Out of the 45 patients from the dialysis center, 30 patients are from Davita Dialysis Center in Mount Carmel (dialysis center 1) and 15 patients are from Davita Dialysis Center in Selinsgrove (dialysis center 2). Graph 1 shows the breakdown of the number of patients who completed the questionnaire at each center.



Graph 1: Number of Patients Who Completed Questionnaire

Age Groups at the Centers

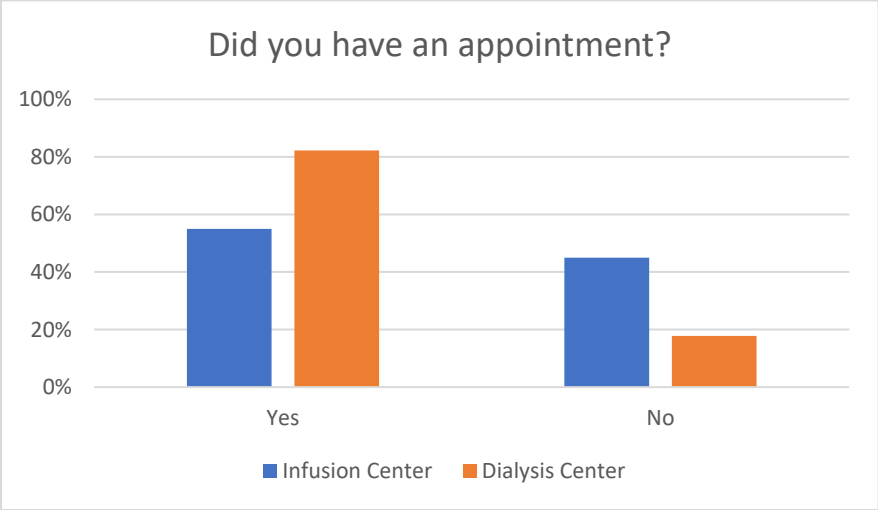
Graph 2 presents the breakdown of age groups at the centers. Although there was no statistically significant difference in age between patients at infusion center and dialysis center, a majority (40%, n = 8) of infusion center patients scored in the category "50 – 75 years" of age whereas a majority (47%, n = 21) of dialysis center patients scored in the category "75 and older" of age. From our results, we can suggest that patients who get treated at the dialysis center are usually patients with kidney disease which commonly fall among older age group patients.



Graph 2: Age Group of Patients at Infusion Center and Dialysis Center

Appointments at the Centers

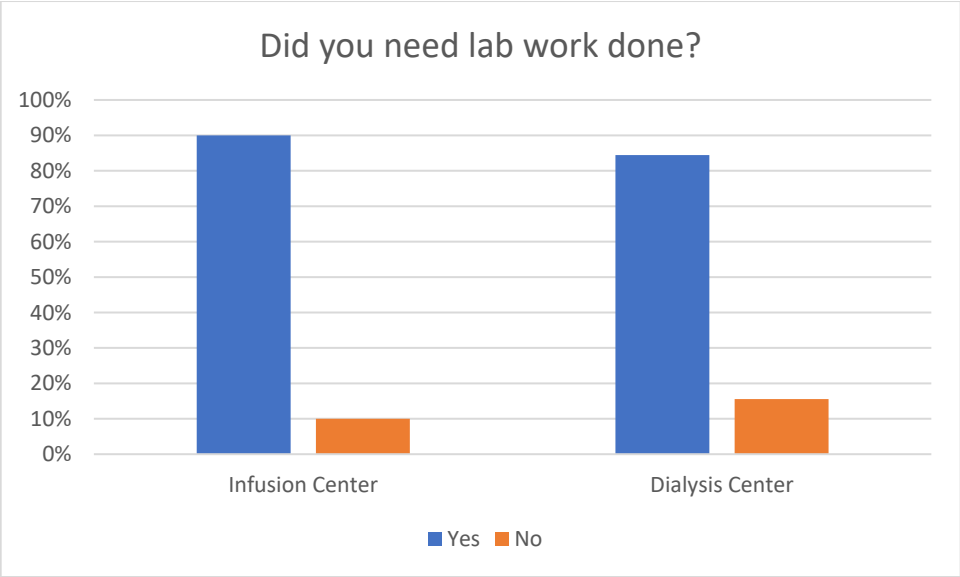
Graph 3 shows the comparison of patients with appointment and without appointments at the infusion center and dialysis center. A statistically significant higher percentage of patients at the dialysis center (82%, n = 37) have an appointment compared to the patients at the infusion center (55%, n = 11). ($x^2 = 5.31$, df = 1, p = 0.02).



Graph 3: Appointments at Infusion Center and Dialysis Center

Lab Work at the Centers

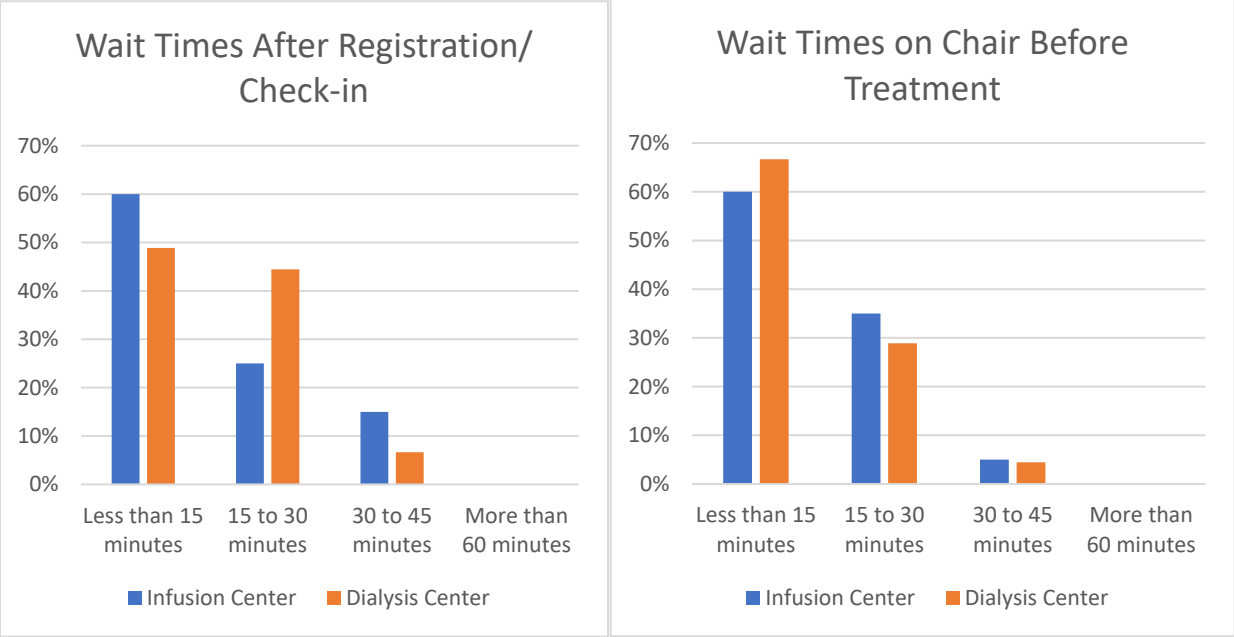
Graph 4 presents the percentage of patients who needed lab work done and who did not need lab work done at the infusion center and the dialysis center. Majority of the patients require lab work done before their treatment at the infusion center (90%, n = 18) and the dialysis center (84%, n = 38). There is no significance between the infusion center and the dialysis center.



Graph 4: Lab Work at Infusion Center and Dialysis Center

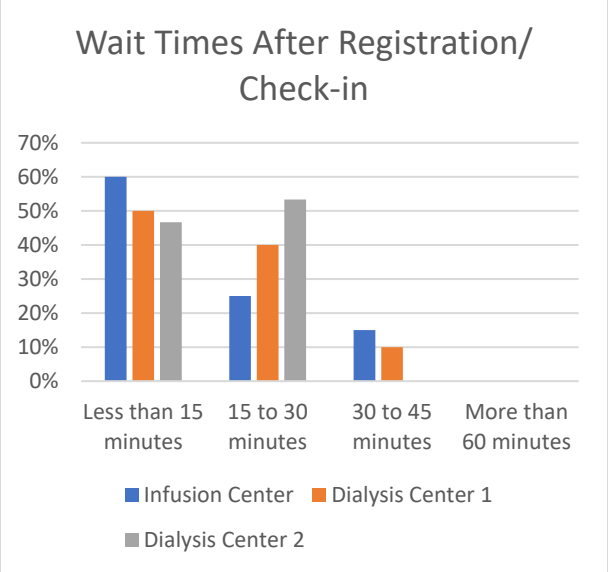
Wait Times at the Centers

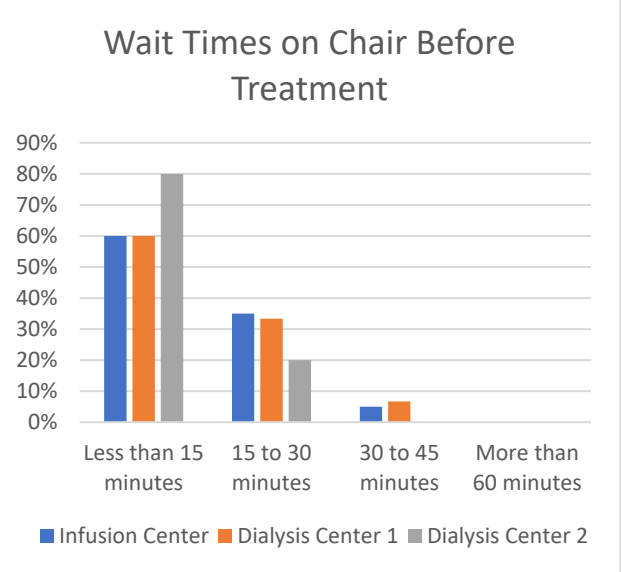
Graph 5 presents the comparison of wait times after registration or check-in and wait times on chair before receiving treatment at the infusion center and dialysis center. Majority of the patients at the infusion center (60%, n = 12) and at the dialysis center (49%, n = 22) waited less than 15 minutes after registration or check-in before they go onto the treatment chair. According to graph X, a majority of patients at the infusion center (60%, n = 12) and at the dialysis center (67%, n = 30) also waited less than 15 minutes on the treatment chair before getting their treatment.



Graph 5: Wait Times After Registration/ Check-in and On Chair Before Treatment at Infusion Center and Dialysis Center

Graph 6 presents the breakdown of the percentage of patients and their respective wait times at the waiting room and on the chair before receiving treatment for the infusion center and both the dialysis centers. We see that a majority of patients at dialysis center 1 (50%, n = 7) waited for less than 15 minutes at the waiting room before going onto the treatment chair but for dialysis center 2, the majority of patients (53%, n = 8) waited longer with wait times between 15 to 30 minutes at the waiting room before going onto their treatment chair. For wait times on the chair before receiving treatment, we see the opposite where majority of patients at dialysis center 2 (80%, n = 12) waited for less than 15 minutes on the chair before treatment but a lower percentage of patients at dialysis center 1 (60%, n = 18) waited for less than 15 minutes on the chair before treatment.

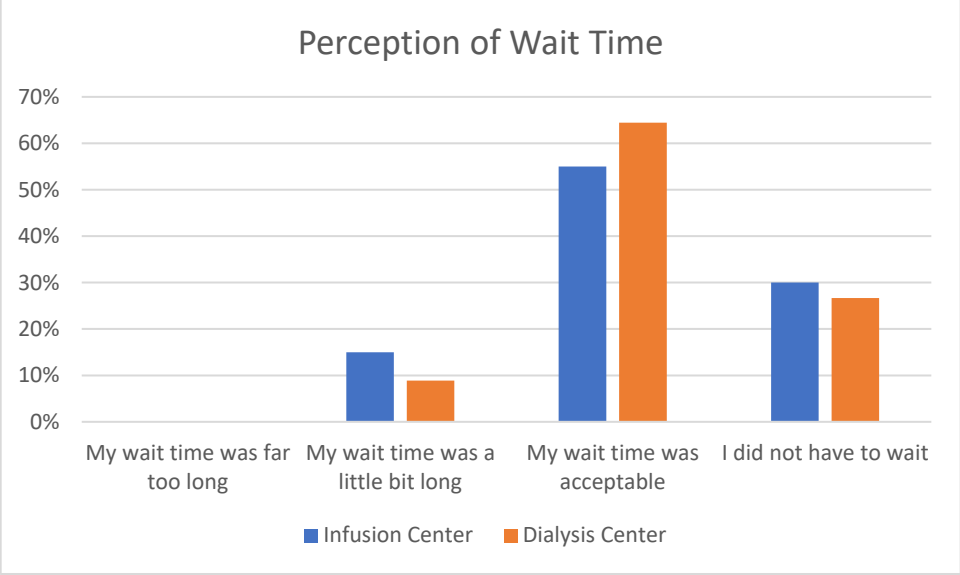




Graph 6: Wait Times After Registration/ Check-in and On Chair Before Treatment at Infusion Center, Dialysis Center 1 & 2

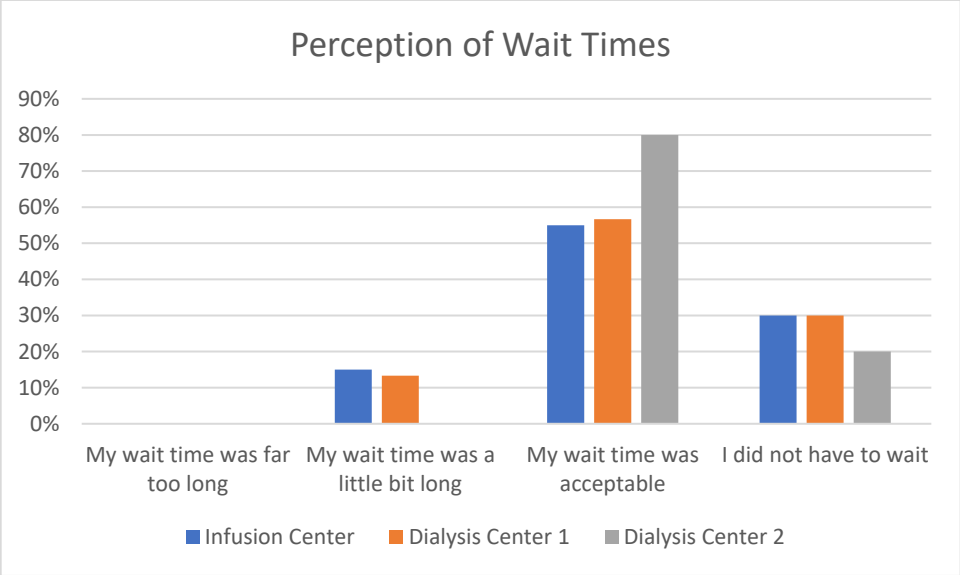
Perception of Wait Time

According to graph 7, a majority of patients at the infusion center (55%, n = 11) and at the dialysis center (64%, n = 29) rated that their wait time was acceptable. 30% of infusion center patients and 27% of dialysis center patients said they did not have to wait. A minority of 15% of infusion center patients and 9% of dialysis center patients complained that their wait time was a little long.



Graph 7: Perception of Wait Time at Infusion Center and Dialysis Center

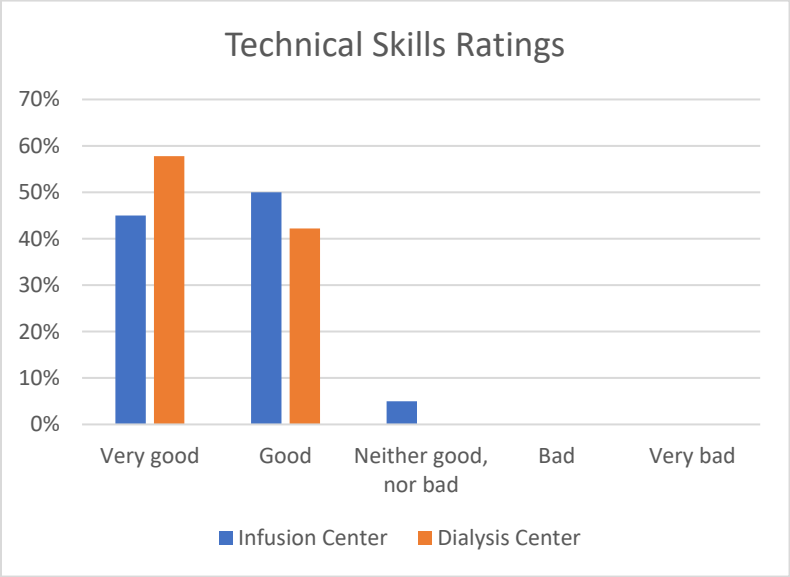
From Graph 8, when we break down the dialysis center data into two dialysis centers, we saw that majority of patients at dialysis center 2 (80%, n = 12) rated that their wait time was acceptable and the rest of the patients said they did not have to wait. On the other hand, only 57% patients at dialysis center 1 rated their wait time was acceptable, 30% said they did not have to wait and 13% said their wait time was a little bit long. Overall, patients at dialysis center 1 rated a longer perception of waiting time compared to the patients at dialysis center 2.



Graph 8: Perception of Wait Time at Infusion Center, Dialysis Center 1 & 2

Technical Skills at the Centers

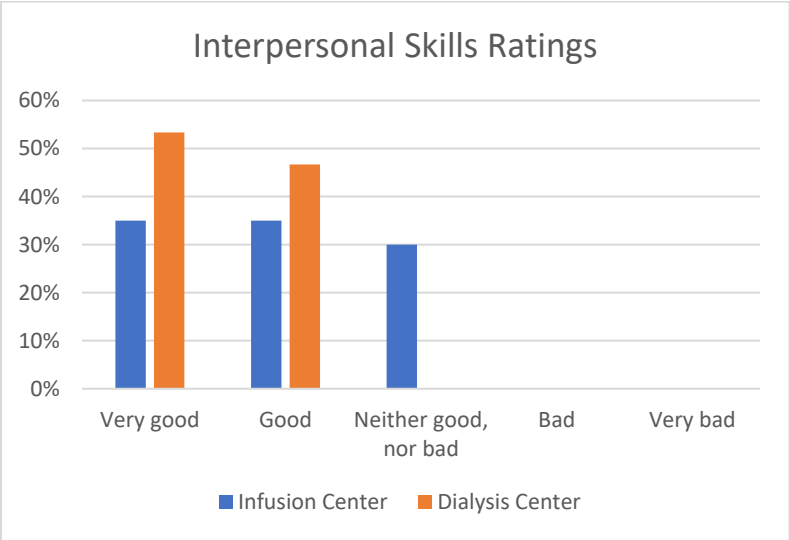
Graph 9 shows that the comparison of technical skills ratings of the clinical staff between the infusion center and dialysis center. We can see that the technical skills of the clinical staff is slightly better for the dialysis center compared to the infusion center. A majority of dialysis center patients (58%, n = 26) rated their clinical staff having "very good" technical skills and a smaller percentage of infusion center patients (45%, n = 9) rated their clinical staff having "very good" technical skills. 42% of dialysis center patients and 50% of infusion center patients rated their clinical staff having "good" technical skills. One patient at the infusion center gave a "neutral" rating for the technical skills of the clinical staff.



Graph 9: Technical Skills Ratings of the Clinical Staff at Infusion Center and Dialysis Center

Interpersonal Skills at the Centers

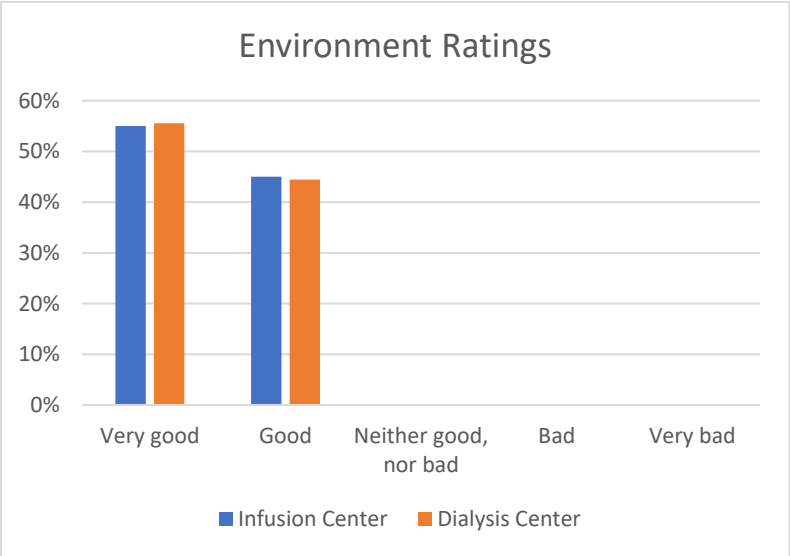
Graph 10 presents the comparison of interpersonal skill ratings of the clinical staff at the infusion center and the dialysis center. A statistically significant higher proportion of patients at the dialysis center rated the interpersonal skills of the staff "very good" (53%, n = 24) and "good: (47%, n = 21) compared to the patients at the infusion center ($x^2 = 14.91$, df = 2, p = 0.0005). Six infusion center patients gave the interpersonal skills of the clinical staff a "neutral" rating.



Graph 10: Interpersonal Skills Ratings of the Clinical Staff at Infusion Center and Dialysis Center

Environment of the Centers

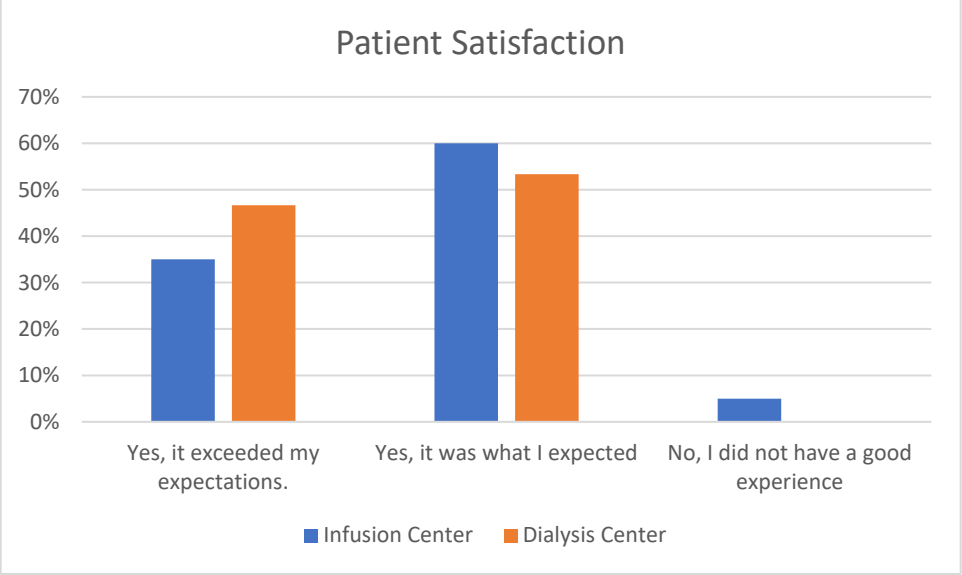
Graph 11 presents the comparison of environment ratings between the infusion center and the dialysis center. 55% of infusion center patients and 56% of dialysis center patients gave the environment of the centers a “very good” rating. 45% of infusion center patients and 44% of dialysis center patients rated “good” for environment at the centers. There is almost no difference in ratings for both the centers.



Graph 11: Environment Ratings at Infusion Center and Dialysis Center

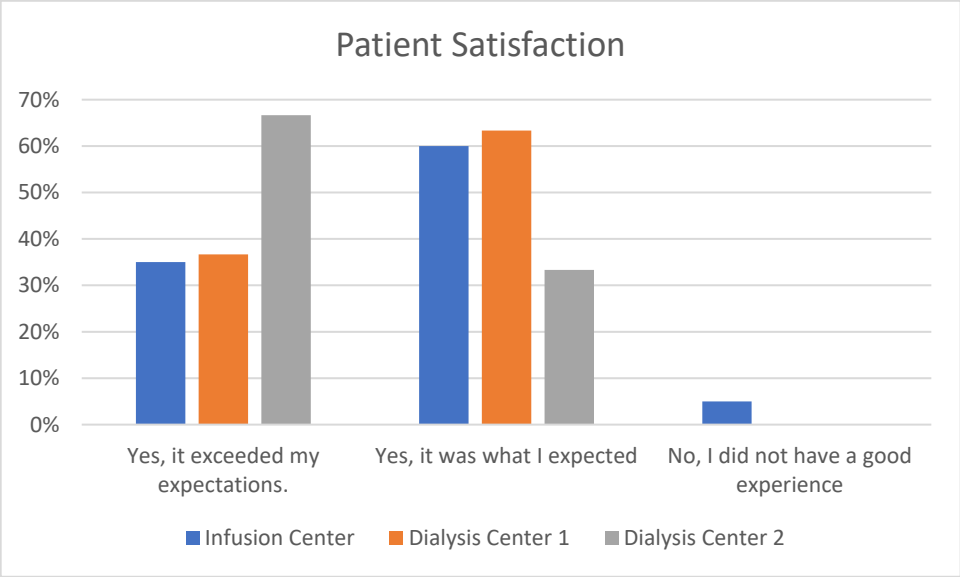
Patient Satisfaction at the Centers

Graph 12 presents the comparison of patient satisfaction between the infusion center and dialysis center. A majority of patients at the infusion center (60%, n = 12) and a majority of patients at the dialysis center (53%, n = 24) said that their visit was what they expected. 35% of infusion center patients and 47% dialysis center patients said their visit exceeded their expectations. One person at the infusion center said that they "did not have a good experience".



Graph 12: Patient Satisfaction at Infusion Center and Dialysis Center

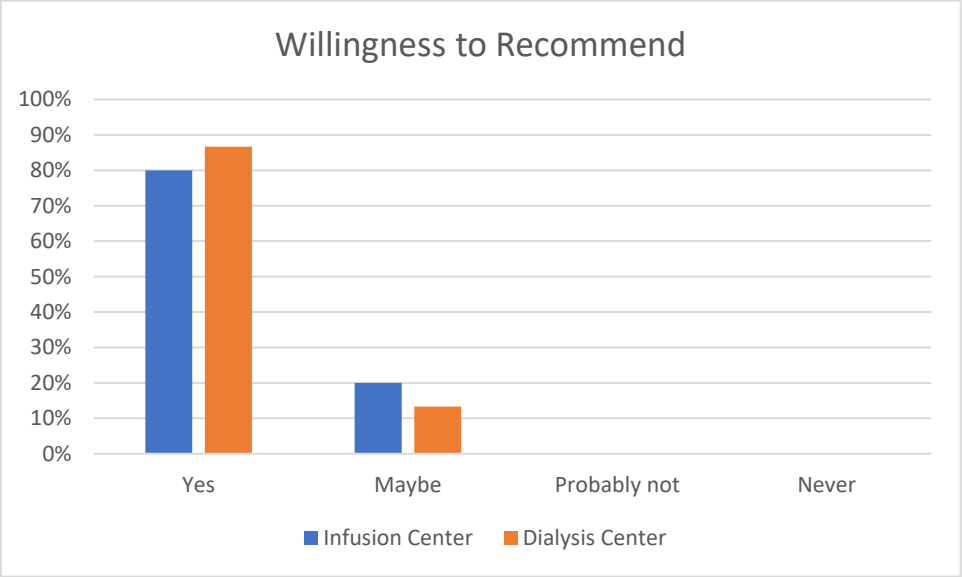
Graph 13 presents the breakdown of patient satisfaction for infusion center, dialysis center 1 and dialysis center 2. We saw that a majority of patients at dialysis center 2 (67%, n = 10) said they their visit exceeded their expectations compared to only 37% of patients at dialysis center 1 and 35% of patients at infusion center.



Graph 13: Patient Satisfaction at Infusion Center, Dialysis Center 1 & 2

Willingness to Recommend

Graph 14 presents the comparison of patients' willingness to recommend the center to their friends and family at the infusion center and dialysis center. A majority of infusion center patients (80%, n = 16) and dialysis center patients (87%, n = 39) said "yes" to recommending the centers to family and friends. 20% of infusion center patients and 13% of dialysis center patients said "maybe" to recommending the centers to their friends and family



Graph 14: Patient Willingness to Recommend to Friends and Family at Infusion Center and Dialysis Center

Discussion

This study aimed at documenting the impact of wait times at the waiting room and on the treatment chair, technical skills and interpersonal skills, and the environment on patient satisfaction in infusion center and dialysis centers. Our study found that majority of the patients rated their visit to the infusion center and dialysis centers exceeded their expectations or it was what they expected. We did not find many patients who rated they "did not have a good experience". Using chi-squared tests, statistical significant differences between the infusion center and dialysis center were found with respect to two out of 11 items on the questionnaire. Based on Table 1, the two items are related to appointments and interpersonal skills.

SURVEY	ITEM	P-VALUE
Q1	Age Group	0.17
Q2	Appointment	0.06
Q3	Lab Work	0.55
Q4	Wait Time After registration/ Check-in	0.41
Q5	Wait Time On Treatment Chair	0.60
Q6	Wait Time Expectation	0.46
Q7.1	Technical Skills	0.13
Q7.2	Interpersonal Skills	0.0001
Q7.3	Environment	0.34
Q8	Patient Satisfaction	0.13
Q9	Willingness to Recommend	0.49

Table 1: P-values from Chi-Squared Tests

Impact of Age of Patients on Patient Satisfaction

Even though the dialysis centers have slightly older patients compared to the infusion center and patient satisfaction is lower in the infusion center, it is unclear to us if age group plays a role in affecting patient satisfaction in our study. Numerous studies have reported that studying the relationship between age and patient satisfaction is a complex one. Jaipaul et al (2003) found that patient satisfaction scores peak at the age 65 before declining. One possible cause is that as patient ages and become more familiar with healthcare delivery, their expectations towards healthcare may decrease and thus result in higher satisfaction compared to younger patients. Since we have a small sample size of patients for our study, further studies should be conducted to analyze the relationship between age and patient satisfaction.

Impact of Appointments on Patient Satisfaction

The dialysis centers have significantly more patients with scheduled appointments compared to the infusion center. We believe one of the reasons for shorter wait times and perceived wait times at the dialysis centers is due to having scheduled appointments. This further suggests that having appointments might aid in the management of patient flow for centers. Wait times can be reduced significantly with scheduled appointments to improve patient satisfaction.

Impact of Wait Times and Perceived Wait Times on Patient Satisfaction

Our study supports our hypothesis that longer actual and/or perceived wait time lowers patient satisfaction. Common to many studies conducted by other researchers, our study showed that there is a negative relationship between wait times and patient satisfaction. The infusion center has an overall longer wait times in both the waiting room and on the treatment chair as well as perceived wait times compared to the dialysis centers. Factors contributing to the overall longer wait times at the infusion center is unclear in this study. A possible explanation is having less

scheduled appointments and more walk-ins compared to the dialysis centers contributed to the longer wait times at the infusion center.

Impact of Technical Skills, Interpersonal Skills & Environment on Patient Satisfaction

Our study shows that there is no strong effect of the perceived technical skills of the clinical staff on patient satisfaction. Even though dialysis center 1 patients rated their staff higher ratings in technical skills compared to dialysis center 2, dialysis center 2 still has higher patient satisfaction which is due to shorter perceived wait times. Graph 15 shows the differences in technical skill ratings is attached in the Appendix section.

Our study also shows no significant relationship between perceptions of interpersonal skills of the clinical staff and patient satisfaction. Graph 16 in the Appendix shows that there is no difference in the percentage of patients who gave their clinical staff "very good" and "good" ratings at both the dialysis center even though dialysis center 2 has higher patient satisfaction compared to dialysis center 1.

Similar to skills ratings, our study shows that there is also no relationship between the environment of the centers and patient satisfaction. Graph 17 in the Appendix shows that patients at the infusion center and the dialysis center had similar ratings for the environment of the centers.

Impact of Patient Satisfaction on Willingness to Recommend Centers

Kreitz et al (2016) found that longer wait times negatively affect patient satisfaction but not necessarily decrease their likelihood to recommend the orthopedic clinic to their friends and family. Our results showed that while dialysis center 2 have a much higher patient satisfaction compared to dialysis center 1, both the centers have the same percentage of patients who said "yes" to recommending the center to their friends and family (See Graph 18 in Appendix). This suggests that patient satisfaction does not have a strong effect on willingness to recommend to friends and

family. A possible explanation is that although patients were less satisfied with their experience at the centers, they did not believe their experience to be indicative of the center overall.

Differences in Patient Satisfaction Due to Scheduling Process of the Dialysis Centers

The differences in wait time at the waiting room and the wait time on the chair before treatment suggests that dialysis center 1 and 2 have a different scheduling process. Dialysis center 1 quickly sits patients on the treatment chair but have their patients wait on their treatment chair longer to before getting treatment. On the other hand, dialysis center 2 have patients wait at the waiting area longer before sitting them in their treatment chair for treatment. Dialysis center 2 has better patient satisfaction compared to dialysis center 1 based on Graph 13.

Bleustein et al (2014) found that satisfaction scores are more sensitive to exam room wait times than to waiting room wait times. Our results support his finding, as dialysis center 1 patients who waited much longer on their treatment chairs have lower patient satisfaction compared to dialysis center 2 patients. Reasons for dissatisfaction with the longer wait time on the treatment chair have not been examined fully. However, there might be several possible explanations such as patients expecting to get their treatment started since they are on the treatment chair or patients might have lack of material to engage with while they are on their treatment chair. Our results suggest that in the event the clinic falls behind schedule, it is better to have patients wait in the waiting room rather than immediately place them on their treatment chairs.

Conclusions and Recommendations

In conclusion, we know that patient wait times strongly impact patient satisfaction. We discovered that longer wait time in the treatment chair appears to have a greater negative impact on patient satisfaction. Furthermore, we found that having scheduled appointments may significantly reduce wait times at the centers.

While the biggest goal of the healthcare system is to provide the highest quality care to their patients, this study emphasizes the single dimension of patient satisfaction. In addition to wait times, a better understanding of other factors that impact patient satisfaction in this study will shine a light to offer improvement solutions to healthcare systems. Findings from this study can be used as a basis to plan interventions for improvement of patient satisfaction.

The study has limitations. We had only a small total sample size of patients who completed the questionnaire for both the infusion center and dialysis centers. A study with a larger sample size over a longer study period should be repeated at infusion center and dialysis centers to further validate our findings.

Second, we only collected data for the perceived wait times by patients and not actual the length of time that individual patients waited in the waiting room and on the chair before receiving treatment. In future work, it would be meaningful to collect both the actual wait times and the perceived wait times so that deviations between the actual wait times and perceived wait times can be assessed.

Third, future studies should include additional granularity on reasons for dissatisfaction. It would have been helpful to capture more information from the one patient who “did not have a

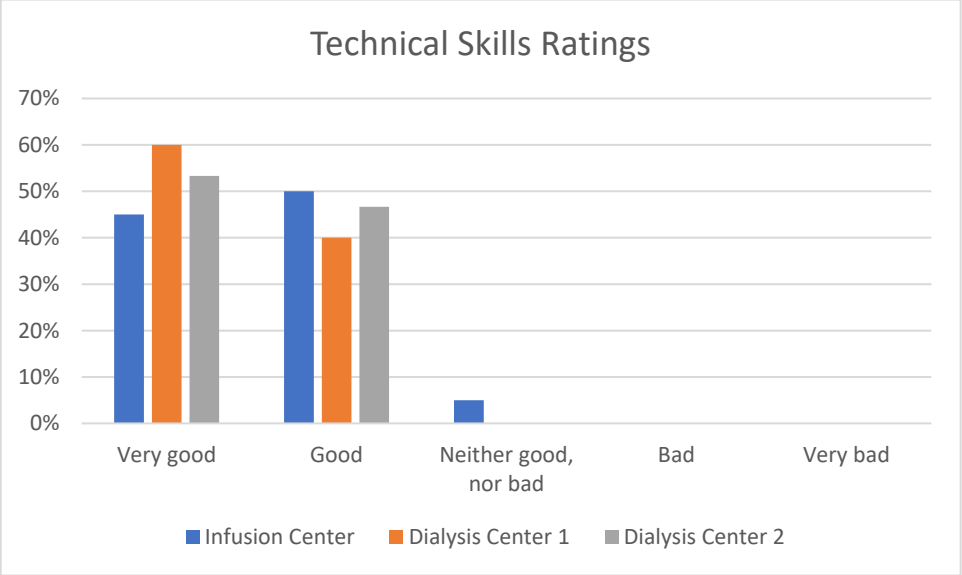
good experience" at the infusion center. The patient perceived his wait time was a little bit long as the patient waited 30-60 minutes at the both the waiting room and on the infusion chair before receiving treatment.

Acknowledgements

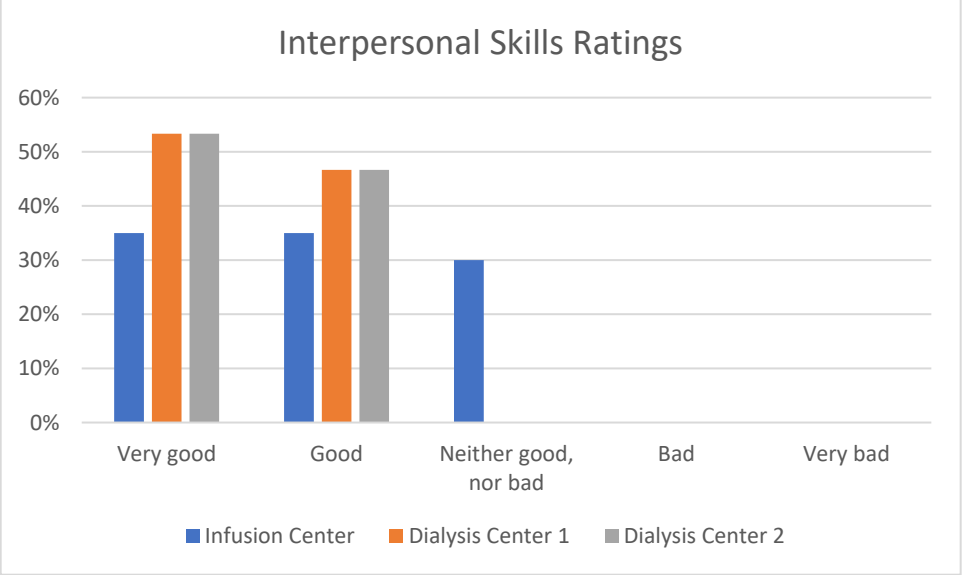
First, I would like to thank Professor Glenn Mitchell for helping in study the design and data analysis of this research study. I would also like to thank Professor Chaza Abdul for assistance in survey data collection at Geisinger Infusion Center and Davita Dialysis Centers.

Appendix

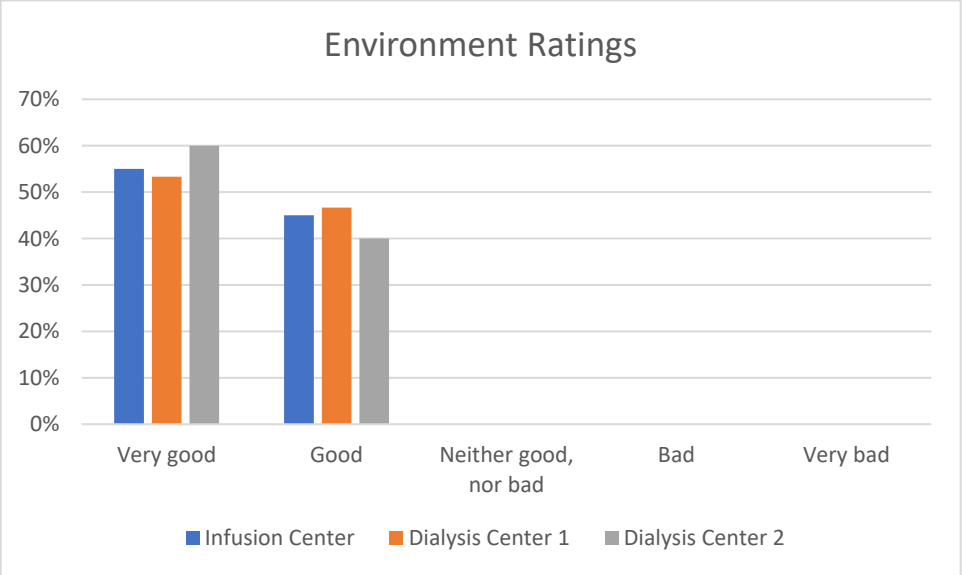
Additional Histograms



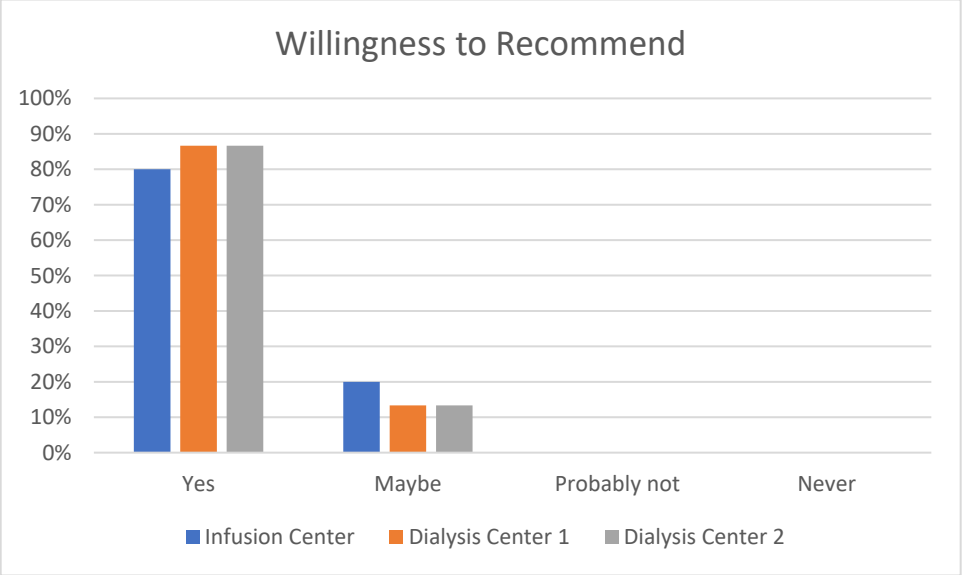
Graph 15: Technical Skills Ratings of the Clinical Staff at Infusion Center, Dialysis Center 1 & 2



Graph 16: Interpersonal Skills Ratings of the Clinical Staff at Infusion Center, Dialysis Center 1 & 2



Graph 17: Environment Ratings at Infusion Center, Dialysis Center 1 & 2



Graph 18: Patient Willingness to Recommend to Friends and Family at Infusion Center, Dialysis Center 1 & 2

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