

Social Determinants of Health Impact on Patient Perception within a Home Infusion and Specialty Pharmacy Setting

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[https://doi.org/10.70776/
KVJG2814](https://doi.org/10.70776/KVJG2814)

ABSTRACT

Background

Home infusion therapy is an established alternative site of care, from a hospital or outpatient infusion center, for patients requiring administration of infusion medications through a needle or venous access device. Supported by clinically trained pharmacists and nurses, this care model allows patients to receive therapy in their homes, either through nurse-administered or self-administered infusions. Home infusion therapy has been associated with improved quality of life, reduced disruption to daily activities, and comparable clinical outcomes to traditional care settings.

Purpose

This study aimed to assess perceptions of home infusion therapy across diverse patient backgrounds (demographic, clinical status, racial, level of education, and geographical location). Guided by the U.S. Department of Health and Human Services Social Determinants of Health (SDoH) framework, a 30-question survey was created to study clinical experiences alongside SDoH domains, such as financial impact, access to care, cultural sensitivity, emotional well-being, and home safety.

Methods

A cross-sectional survey was administered to a random 10% sample (n=300) of a national home infusion provider's patient population. A total of 268 patients completed the nurse-administered survey between April 1 and July 31, 2024. Inclusion criteria required active infusion under company-employed nurses. Patient conditions included autoimmune, neuromuscular, primary immunodeficiency, gastrointestinal, rheumatologic, and inflammatory diseases. Survey responses were captured using Likert scale and binary ("Yes/No") formats, with Likert scale results summarized using median, interquartile range (IQR), and % of top anchor responses. The survey assessed accessibility, awareness, safety, financial impact, cultural awareness, mood improvement, and overall impression of home infusion therapy.

Results

The cohort included 62% females and 38% males, with a mean age of 64. Immunoglobulin therapy represented 79% of patients and biologic therapies 21%. Patients overwhelmingly perceived home infusion as cost- and timesaving (median = 10, IQR (1,3): 10,10), with 85% citing strong financial benefits. Accessibility barriers, such as transportation or caregiver availability, were noted by a minority and about half of the population, respectively. Patients reported high confidence in the safety of home infusions (median = 10, IQR (1,3): 10,10), and 87% found the therapy easy to access. Mood improvement was substantial (median = 10, IQR (1,3): 10,10), and 81% felt home infusion positively impacted emotional well-being. Cultural understanding by health care staff, in general, was rated variably; while 83% felt culturally understood, 17% did not. Over 60% of patients reported receiving infusion therapy away from home was difficult. Patients reported a strong preference for home infusion due to convenience and reduced exposure risk compared to infusion centers.

Conclusions

Home infusion therapy is highly valued by diverse patients, for its financial, work-life balance, mental health, and safety-related advantages. These findings reinforce the need for broader adoption and education about home infusion as a patient-centered care model aligned with holistic health outcomes.

Keywords: Social determinants of health, patient perception, satisfaction, home infusion, immune globulin, immunoglobulin

Introduction

Home infusion is an alternative site of care for patients requiring the administration of medications, like immunoglobulin (Ig) and biologic therapy through a needle or venous access device in a setting outside of a hospital, medical facility or outpatient infusion center. This service is supported by specialty pharmacies and home infusion companies with care provided by professionals who have obtained additional training.¹⁻¹⁰ This shift from traditional sites allows patients to receive infusions in the comfort of their own home, either with an infusion nurse or self-administered by the patient.

This model has been associated with increased patient satisfaction, reduced disruption to daily life activities, cost savings, and has demonstrated comparable clinical efficacy and safety outcomes to traditional settings such as hospital and/or infusion centers.^{3,5-8,10-16} As data continues to mount in support of its clinical and quality of life benefits, the scope of therapies offered in the home setting continues to expand.^{4,8,9,17}

This study aimed to conduct a comprehensive analysis of patient perception regarding the benefits and challenges of home infusion therapy, specifically Ig and non-Ig therapies. It focused on a diverse patient population, encompassing varying medical conditions, race, education levels, and geographical locations.

We conducted a 30-question survey guided by the U.S. Department of Health and Human Services (HHS) Social Determinants of Health (SDoH) framework.¹⁸ SDoH are non-medical factors that shape a person's health and well-being. Examples of these factors include the environment where people are born, live, go to school, play, worship, age, and their access to power, money, and resources.¹⁷⁻²¹ The 5 key domains of SDoH are: Economic Stability, Education Access and Quality, Health Care Access and Quality, Neighborhood and Built Environment, and Social and Community Context.¹⁷⁻²¹

Based on SDoH, Economic Stability refers to a person's ability to afford items like housing, food, health care, and other life necessities. Education

Access and Quality describes the education someone receives from a childhood to adulthood that shapes long-term health and economic opportunities. Health Care Access and Quality involves whether people can get affordable and culturally aware medical services and be able to navigate the current health care system. Neighborhood and Built Environment examines physical and environmental conditions of where people live and move to (e.g., housing conditions, transportation availability, green spaces, and exposure to hazards that could affect a person's safety and health). Social and Community Context relates to the relationships between family, friends, coworkers, and other community members.¹⁷⁻²¹

Our survey was modified to supplement questions that explored patient perceptions of home infusion therapy behind its clinical benefits. Specifically, these questions assessed patient's access to and awareness of home infusion services, financial responsibility/burden of treatment, perceptions of safety, cultural awareness and sensitivity of health care providers, emotional well-being during therapy, and a patient's overall impression or perception of home infusion therapy. This multidimensional approach was designed to capture a more complete understanding of how home infusion therapy affects patients' lives beyond clinical outcomes by incorporating the principles of SDoH.

Methods

Study Design

A 10% random sampling of over 3,000 patients, was performed by a national home infusion provider, CSI Pharmacy, resulting in a final sample size of 300 patients. Of these patients, survey data created from a hybrid HHS SDoH survey and custom questions related to home infusion therapy were collected from a nurse-administered survey of 268 patients receiving home infusion therapy between April 1, 2024 and July 31, 2024.

The survey assessed financial and time impact, accessibility and awareness, mood improvement, cultural understanding, home safety, and overall impression of home infusion therapy.

Participants

Patients were randomly selected if they were under the care of a company-employed nurse for home infusion therapy or training of self-administered subcutaneous therapy. Patients served by agency nurses were excluded.

Data Analysis

Survey responses were collected using “Yes or No” questions and Likert scaled ranges (1-10) with defined bottom and top response anchors. Statistical analyses were performed to summarize key findings and identify subgroup differences.

Protocol Approval

This research qualifies for exemption from Institutional Review Board (IRB) oversight under Category 2 of the Common Rule, as it involved survey procedures using a nurse-administered instrument and recorded information cannot readily identify the patient. No personal identifiers were collected, and disclosure of responses would not reasonably place patients at risk or harm, ensuring protection of patient confidentiality.

Results

This study included 167 women (62%) and 101 men (38%) with a mean age of 64 (range: 2-92). Racial categories included African American, American Indian/Alaska Native, Asian, Hispanic/Latino, Unreported, White, and White/American Indian/Alaska Native. Geographical regions included the Midwest, Northeast, South, and West. Highest Level of Education ranged from Some High School or Below, High School/GED, Some College, Bachelor’s Degree, Master’s Degree, and Doctoral Degree (Table 1).

Note: Variables, such as race, geographical location, age, days of service at time of survey, educational levels, and patient diagnoses will be analyzed in future studies to further explore their impact on the results on our findings.

Ig therapy was administered in 79% of patients, with 73.5% (n=197) receiving IVIG and 5.6% (n=15) receiving SCIG. Biologic therapies were used in 21% of patients (n=56). Patient

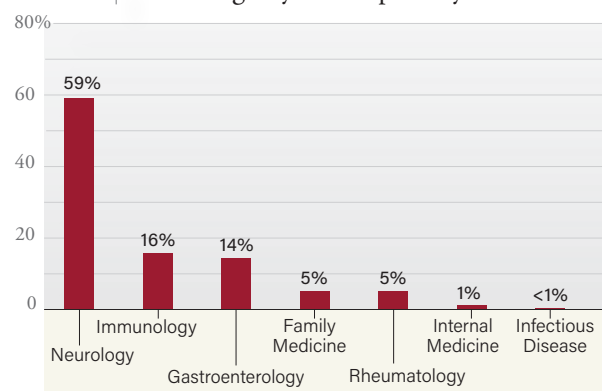
TABLE 1 | Patient Demographics

Variable	Home Infusion Therapy Patients (n = 268)
Sex	
	n (%)
Female	167 (62%)
Male	101 (38%)
Age	
Median (Range)	64 (2-92)
2-11	3 (1.1%)
12-21	5 (1.9%)
22-31	11 (4.1%)
32-41	32 (11.9%)
42-51	27 (10.1%)
52-61	48 (17.9%)
62-71	67 (25%)
72-81	64 (23.9%)
82-92	11 (4.1%)
Race	
African American	24 (9%)
American Indian/Alaska Native	6 (2.2%)
Asian	3 (1.1%)
Hispanic/Latino	9 (3.4%)
Unreported	7 (2.6%)
White	218 (81.3%)
White and American Indian/Alaska Native	1 (0.4%)
Geographic Location	
Midwest	25 (9.3%)
Northeast	2 (0.7%)
South	187 (69.8%)
West	54 (20.2%)
Highest Level of Education	
Some High School or Below	13 (4.9%)
High School/GED	60 (22.4%)
Some College	92 (34.3%)
Bachelor's Degree	67 (25%)
Doctoral Degree	11 (4.1%)
Master's Degree	25 (9.3%)
Days on Service at Time of Survey (Months)	
Median (Range)	10 (0-99)
0-10	140 (52.2%)
11-21	71 (26.5%)
22-31	28 (10.4%)
32-40	12 (4.5%)
41-50	6 (2.2%)
51-60	5 (1.9%)
61-70	1 (0.4%)
81-90	2 (0.7%)
91-100	3 (1.1%)

conditions included immunodeficiency, autoimmune, neuromuscular, gastrointestinal, rheumatologic, and inflammatory conditions (Table 2).

Referring physician specialties included: neurology, family medicine, internal medicine, gastroenterology, rheumatology, immunology, and infectious disease (see Figure 1).

FIGURE 1 | Referring Physician Specialty



For binary data (Yes/No responses), the mean was used to represent the proportion of affirmative responses. This approach was applied due to the nature of the questions and answers in the survey.

Since the majority of the data was collected in a Likert scale format (1-10), we reported median scores rather than mean and standard deviations since the Likert scale represents ordinal data (i.e., ranked categories) rather than continuous data. Median allowed for a more accurate measure of central tendency without assuming equal intervals, making it more robust against skewed distributions and outliers. Likert Scale: Reported as median values with corresponding interquartile ranges (IQR: 1,3 – designated throughout as IQR: X, X) and percentages reflect the proportion of patients selecting the top anchor response.

1. Financial and Time Impact

Financial Time and Impact describes how patients experience home infusion therapy, in relation to their economic situation, work-life balance, and employment status. It examines whether a patient's treatment option for home infusion therapy saved them time and money, supported their ability to manage schedules, and whether their current employment created difficulties to receive home infusion therapy.

TABLE 2 | Patient Diagnosis

Variable	Home Infusion Therapy Patients (n = 268)
Diagnoses	
Acute Transverse Myelitis	2 (0.7%)
Ataxia	1 (0.4%)
Autonomic Neuropathy	1 (0.4%)
Chronic Inflammatory Demyelinating Polyneuropathy	68 (25.4%)
Collagenous Colitis	1 (0.4%)
Crohn's Disease	25 (9.3%)
Demyelinating Disease of Central Nervous System, Unspecified	3 (1.1%)
Dermatomyositis	2 (0.7%)
Dermatopolymyositis	4 (1.5%)
Encephalitis	7 (2.6%)
Guillain-Barré Syndrome	2 (0.7%)
Hereditary and Idiopathic Neuropathy	1 (0.4%)
Idiopathic Progressive Neuropathy	3 (1.1%)
Inclusion Body Myositis	1 (0.4%)
Juvenile Dermatomyositis	1 (0.4%)
Lambert-Eaton Myasthenic Syndrome	1 (0.4%)
Multifocal Motor Neuropathy	5 (1.9%)
Multiple Sclerosis	7 (2.6%)
Myasthenia Gravis	44 (16.4%)
Myositis	1 (0.4%)
Neuromyelitis Optica Spectrum Disorder	1 (0.4%)
Other Symptoms and Signs Involving the Musculoskeletal System	1 (0.4%)
Polymyositis	8 (3.0%)
Polyneuropathy	6 (2.2%)
Primary and Secondary Immunodeficiency	50 (18.7%)
Rheumatoid Arthritis	1 (0.4%)
Sjögren's Syndrome	1 (0.4%)
Stiff-Person Syndrome	5 (1.9%)
Ulcerative Colitis	15 (5.6%)
Current Therapy	
CD-20 Directed Cytolytic Antibody	6 (2.2%)
Complement Inhibitor	5 (1.9%)
Integrin Receptor Antagonist	13 (4.9%)
Interleukin-12 and -23 Antagonist	13 (4.9%)
Interleukin-23 Antagonist	4 (1.5%)
IVIg	197 (73.5%)
Neonatal Fc Receptor Blocker	3 (1.1%)
SCIG	15 (5.6%)
Tumor Necrosis Factor (TNF) Blocker	12 (4.5%)

TABLE 3 | Time and Cost Savings

Survey Item	Median (IQR)	% of Patients Selecting Top Response of "10"
<i>Did the option of home infusion therapy provide a time and cost savings?</i>	10 (10,10)	85.45
1 = Not At All 10 = Yes, A Lot		
<i>Did the option of home infusion therapy help balance work schedule?</i>	10 (9,10)	73.13
1 = Not At All 10 = Yes, A Lot		
<i>Did job, or lack of one, make it difficult for home infusion therapy?</i>	2 (1,6)	11.57
1 = Not At All 10 = Yes, A Lot		

1a. Time and Cost Savings

Regarding time and cost savings, the study revealed that patients strongly agreed that home infusion therapy provided significant time and cost savings, as evidenced by a median score of 10 (IQR: 10,10) on a 1–10 scale, with 1 = Not At All and 10 = Yes, A Lot. The highest rating was selected by 85.45% of patients (n=229), demonstrating a widespread perception of financial benefits, while 2.24% (n=6) reported the lowest rating (Table 3).

1b. Work-Life Balance

For a work-life balance, home infusion therapy was seen as beneficial, on a 1-10 scale with 1 = Not At All and 10 = Yes, A Lot, with 73.13% of patients (n=196) selecting the highest rating (median score: 10, IQR: 9,10),

whereas, 14.18% (n=38) selected the lowest rating whether home infusion was beneficial for a work-life balance (Table 3).

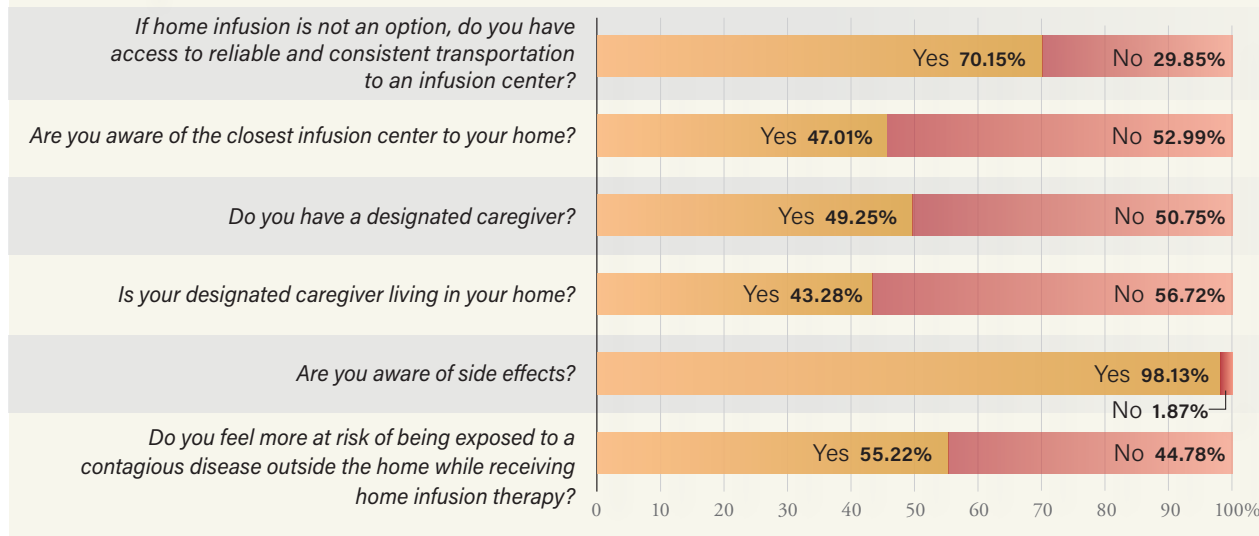
1c. Employment-Related Challenges

Patients reported employment-related barriers to receiving home infusion were minimal, with a median difficulty score of 2 (IQR: 1,6) on a scale of 1-10 with 1 = Not At All and 10 = Yes, A Lot. Only 11.57% of patients (n=31) selected the highest rating, compared to 48.51% (n=130) who reported the lowest rating for employment-related barriers to receiving home infusion (Table 3).

2. Accessibility and Awareness

Accessibility and Awareness describes how patients navigated and understood the process of receiving infusion therapy, whether at home or in a traditional setting, such as a hospital or infusion center. It reports on patients' ability to access care in the home setting, including having reliable transportation to infusion centers, support from caregivers, and the ease of receiving their therapy supplies in either setting. It also examines how patients felt about their treatment, such as awareness of nearby infusion centers, knowledge of potential side effects of their treatment, perceptions of safety of infusion therapy between the home and infusion center environments, and confidence in receiving support should the case arise. Together, these two areas reflected how comfortable and confident patients felt in receiving home infusion therapy, when compared to other infusion locations (Figure 2).

FIGURE 2 | Accessibility and Awareness



2a. Access to Transportation

Of the patients surveyed, 70.15% (n=188) reported having reliable transportation to an infusion center if home infusion was not an option, whereas 29.85% (n=80) reported concerns about transportation (Figure 2).

2b. Awareness of Nearby Infusion Centers

Regarding whether patients were aware of the closest infusion center to their home, 47.01% (n=126) indicated they were aware, while 52.99% (n=142) were not (Figure 2).

2c. Presence of a Designated Caregiver

For patients indicating if they had a designated caregiver, 136 patients (50.75%) reported not having a designated caregiver, while 132 patients (49.25%) indicated they did (Figure 2).

2d. Caregiver Living in the Home

As to whether patients indicated that a caregiver was living in their home, 43.28% (n=116) responded that they, did, compared to 56.72% (n=152) did not (Figure 2).

2e. Awareness of Treatment Side Effects

When patients were asked whether they were made aware of the side effects of their treatment, 98.13% (n=263) indicated they had been informed of their therapy's side effects, where 1.87% (n=5) reported they were not (Figure 2). Upon evaluation of this survey response, those patients were offered re-education relative to their treatment.

2f. Perceived Risk of Disease Exposure Outside the Home

In relation to how patients felt whether they were more at risk of being exposed to a contagious disease outside of their home while receiving their respective infusion therapies (e.g., hospital/infusion center), 55.22% (n=148) responded yes, they did perceive a heightened risk while 44.78% (n=120) reported no, they did not perceive an increased risk (Figure 2).

2g. Ability to Pay for Transportation to Treatment Outside of the Home

Patients rated the difficulty of affording transportation (e.g., ride or gas) to receiving infusion therapy outside of the home with a

TABLE 4 | Accessibility and Awareness

Survey Item	Median (IQR)	% of Patients Selecting Top Response of "10"
<i>How difficult is it to pay for a ride/gas to get infusion therapy outside of the home?</i>	4 (1,8)	18.66
1 = Not Hard At All 10 = Very Hard		
<i>How sure do you feel about your home as a safe and clean environment to receive infusion therapy?</i>	10 (10,10)	82.84
1 = Not Sure 10 = Very Sure		
<i>How sure do you feel about the hospital/ infusion center as a safe and clean environment to receive infusion therapy?</i>	5 (1,10)	26.12
1 = Not Sure 10 = Very Sure		
<i>How sure do you feel that if something went wrong with your home infusion therapy, you could get help?</i>	10 (10,10)	79.10
1 = Not Sure 10 = Very Sure		
<i>How easy was it to receive home infusion therapy when you needed it?</i>	10 (10,10)	87.31
1 = Very Hard 10 = Very Easy		
<i>Did you have trouble getting your infusion therapy/supplies when needed in the home setting?</i>	10 (10,10)	78.36
1 = Always 10 = Never		
<i>Did you have trouble getting your infusion therapy/supplies in the hospital/ infusion center?</i>	1 (1,5)	7.84
1 = Not At All 10 = Yes, A Lot		

median score of 4 (IQR: 1,8), where 1 = "Not Hard At All" and 10 = "Very Hard." While 18.66% (n=50) of patients rated transportation affordability as "Very Hard" to receiving therapy outside of the home, 39.93% (n=107) reported it was "Not Hard At All" (Table 4).

2h. Confidence in Home Safety and Cleanliness

Patients expressed strong confidence in their home being a safe and clean environment for infusion therapy. Using the scale where 1 = "Not Sure" and 10 = "Very Sure" the median score of 10 (IQR: 10,10). A high number of patients, 82.84% (n=222), selected the highest rating of "Very Sure," but only 5.22% (n=14) indicated the lowest rating of "Not Sure" (Table 4).

2i. *Confidence in Hospital/Infusion Center Safety and Cleanliness*

Using the same scale as the previous section, patient confidence in the safety or cleanliness of a hospital or infusion center environment to have their infusion treatment was lower, with a median score of 5 (IQR: 1,10). Only 26.12% (n=70) reported the highest rating of "Very Sure," while 30.22% (n=81) reported the lowest rating of "Not Sure" (Table 4).

2j. *Confidence in Accessing Help if Something Goes Wrong at Home*

Patients demonstrated strong confidence in their ability to receive assistance if complications arose during home infusion therapy. Using the same scale (1 = "Not Sure" and 10 = "Very Sure"), patient responses reflected a median score of 10 (IQR:10,10). A large majority of patients, 79.10% (n=212), selected the highest rating of "Very Sure," compared to only 3.73% (n=10) who reported the lowest rating of "Not Sure." When these patients were queried on their response to confidence in receiving assistance if a complication arose during home infusion therapy, they declined to provide a reason for their response. These patients were reminded to seek care at the nearest emergency room if an emergency arises and to follow-up with their referring physician for further guidance (Table 4).

2k. *Ease of Receiving Home Infusion Therapy*

Patients rated the ease of receiving home infusion therapy, when needed, very high, with a median score of 10 (IQR: 10,10), where 1 = "Very Hard" and 10 = "Very Easy." Most patients, 87.31% (n=234), selected "Very Easy," compared to 2.99% (n=8) who selected "Very Hard" (Table 4).

2l. *Access to Home Infusion Therapy/Supplies at Home*

When it came to whether it was difficult to obtain home infusion supplies when needed in the home setting, the median response was 10 (IQR: 10, 10), where 1 = "Always" and 10 = "Never," with 78.36% (n=210) reporting they "Never" had issues, compared to 7.09% (n=19) who responded they "Always" had issues with their supplies. When this was reviewed across past delivery tickets, 42.10% of patients (n=8) were new to therapy with this home infusion provider and did not have any issues in obtaining home infusion therapy/supplies; therefore, these patients apparently had issues with previous home infusion providers. Upon further review, 47.37% of patients (n=9) reported infusion supply issues were noted prior to going on service with this

home infusion provider. One patient (5.26%) indicated their delays in delivery of home infusion supplies were attributed to a manufacturer shortage/product availability, whereas another patient (5.26%), indicated their delay was due to the annual prior authorization process, which is common across all home infusion companies and hospital/infusion centers (Table 4).

Note: On this particular issue, caution should be exercised when interpreting these results from subgroup self-report due to limited sample sizes and start-of-care dates as these may not reflect broader trends.

2m. *Issues Accessing Infusion Therapy/Supplies in the Hospital/Infusion Center*

Conversely, when evaluating the difficulty of obtaining infusion supplies at the hospital or infusion center, the median score was 1 (IQR: 1, 5), where 1 = "Not At All" and 10 = "Yes, A Lot." Only 7.84% (n=177) indicated they experienced significant difficulty compared to 66.04% (n=21) who reported no difficulty (Table 4).

Note: because his question asked patients to reflect on prior experiences in other hospital or infusion center environments, there was no way to validate the "Yes, A Lot" responses. Also, due to the phrasing of the anchor responses in the original survey, it should be noted that 66.04% of patients selected the bottom anchor ("Not at All") when asked about trouble obtaining IVIG therapy or supplies in the hospital/infusion center setting. This represents a 12.32% difference compared with the 78.36% of patients who selected the top anchor ("Never") in the home infusion setting, suggesting fewer reported access issues in the home environment. However, these findings should also be interpreted with care as responses regarding difficulty obtaining infusion supplies at hospitals or infusion centers reflect patients' previous experiences, which may introduce recall bias and cannot be independently validated.

3. *Mood Impact*

Mood Impact assesses how patients perceived their general mood, most of the time, and whether receiving home infusion therapy contributed to a more positive emotional state compared to traveling to a facility for treatment. These measures provide insight into the psychological aspects of home infusion therapy and its influence on patients' mental and emotional wellbeing.

3a. *Generalized Mood*

Patients reported high levels of generalized mood, with a median mood score of 8 (IQR: 7,10) on a scale from 1 = "Very Sad or Worried" to 10 = "Very Happy and Safe." Among all patients, 38.43% (n=103) selected the highest rating, whereas 1.49% (n=4) indicated the lowest rating for their generalized mood (Table 5).

TABLE 5 | Mood Improvement

Survey Item	Median (IQR)	% of Patients Selecting Top Response of "10"
<i>How do you feel most of the time?</i>	8 (7,10)	38.43
1 = Very Sad or Worried 10 = Very Happy and Safe		
<i>Did receiving home infusion therapy improve your mood compared to traveling to a hospital/infusion center for treatment?</i>	10 (10,10)	80.97
1 = Not Really 10 = Very Much So		

3b. Mood Improvement from Home Infusion Therapy Compared to Traveling to a Hospital Infusion Center for Treatment

Patients overwhelmingly reported that home infusion therapy improved their mood compared to traveling to a hospital/infusion center, with a median score of 10 (IQR: 10,10) with 80.97% of patients (n=217) selecting "Very Much So" on a scale of 1-10, where 1= Not Really and 10= Very Much. In contrast, 3.73% (n=10) reported the lowest rating (Table 5).

4. Cultural Understanding

Cultural Sensitivity and Understanding examines whether patients felt misunderstood by health care staff based on their race or identity and evaluates the inclusivity and sensitivity of care delivered in the home. It also considers the importance of providers'

understanding a patient's cultural background. Additionally, this domain assesses whether home infusion contributes positively to cultural understanding, recognizing that receiving treatment in one's home may promote stronger communication, more personalization of care, and a greater respect for a patient's values.

4a. Perceived Cultural Understanding by Health Care Staff

A majority of patients, 83.21% (n=223), reported feeling that health care staff at their physician's office or hospital understood their culture while 16.79% (n=45) did not (Figure 3).

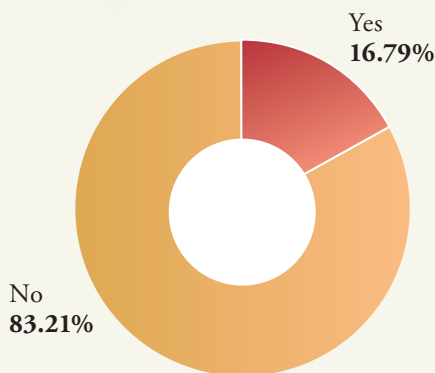
4b. Importance of Cultural Understanding in Health Care

The median rating for the importance of health care providers understanding their culture was 6 on a scale of 1-10, with 1 = Not Important and 10 = Very Important, with an IQR of 1,10. Top ratings reflected 41.42% (n=111) of patients rated cultural understanding as "Very Important," compared to 25.75% (n=69) who selected the lowest rating (Table 6).

4c. Perceived Impact of Home Infusion on Cultural Understanding

The median rating for home infusion's impact on cultural understanding was 10, with an IQR of 5,10. Top responses on a scale of 1-10, with 1 = Not Really and 10 = Very Much So, showed that 57.46% of patients (n=154) rated home infusion as highly beneficial in fostering cultural understanding, whereas 12.69% (n=34) did not (Table 6).

FIGURE 3 | Cultural Understanding



Have you ever felt health care staff didn't understand your culture or identity?

TABLE 6 | Perception of Cultural Understanding

Survey Item	Median (IQR)	% of Patients Selecting Top Response of "10"
<i>How important is it is for health care providers to understand your culture?</i>	6 (1,10)	41.42
1 = Not Important 10 = Very Important		
<i>Does home infusion help with the understanding of your culture?</i>	10 (5,10)	57.46
1 = Not Really 10 = Very Much So		

5. Home Safety

Home Safety assesses how patients’ home and daily life circumstances influence their ability to receive home infusion therapy, including whether they feel safe where they live and can access emergency services if needed. It also examines how feasible it is for patients to leave their home for extended periods of time, specifically for multiple-hour treatment sessions. In addition, it also evaluates the ease or difficulty of accessing nutritious foods, providing insight into real-world factors that shape a patient’s home infusion experience.

5a. Perceived Safety and Emergency Awareness

Regarding home safety, 99.63% (n=267) of patients reported feeling safe where they lived, while only 0.4% (n=1) did not. Similarly, 99.63% (n=267) of patients reported knowing where to seek emergency assistance, where only 0.4% (n=1) did not (Figure 4).

Note: The patient who reported feeling unsafe in their home reported it was due to the crime rate in their geographic location. The patient who did not know where to seek emergency assistance, as with all patients, was reminded to call 911 and/or go to the nearest emergency room if an emergency arises and to follow-up with their referring physician for further guidance.

5b. Difficulty Being Away from Home for Therapy

When asked whether it was difficult to be away from home for approximately 4 hours to receive therapy, 60.45% (n=162) reported it was difficult, while 39.55% (n=106) did not. This difficulty stemmed from travel time, infusion duration, and logistical barriers (Figure 4).

5c. Access to Fresh Food

Having access to purchase fresh fruits and vegetables based on their home location, patients reported a median score of 1 (IQR: 1,5), where 1 = “Not

TABLE 7 | Home Safety

Survey Item	Median (IQR)	% of Patients Selecting Top Response of "10"
<i>How easy is it to get fresh fruits and vegetables?</i>	1 (1,5)	6.72
1 = Not Hard at All 10 = Very Hard		

Hard At All” and 10 = “Very Hard,” with only 6.72% of patients (n=18) rating this as “Very Hard,” when 63.43% (n=170) reported it being “Not Very Hard” (Table 7).

6. Overall Impression of Home Infusion Therapy

Overall Impression of Home Therapy examines the reflection, awareness, and perception change in a patient’s experience with home infusion therapy. It assesses whether patients had previously considered the types of issues raised in the survey prior to starting home infusion therapy, meaning how informed and/or prepared patients felt when starting their treatment. It also assesses whether patients believe that other patients should be made more aware of the potential financial and social advantages associated with home infusion therapy. Finally, it explores whether completing the survey itself contributed to a positive shift in perception, and for those who reported such a change, the magnitude of that shift was documented to capture how reflection and engagement with the survey may have influenced patient understanding and appreciation of home infusion therapy.

6a. Pre-Therapy Consideration of Survey Questions

Survey findings indicated that 45.15% (n=121) of patients had considered the financial and social aspects of home infusion therapy before receiving treatment, while 54.85% (n=147) did not (Figure 5).

FIGURE 4 | Home Safety

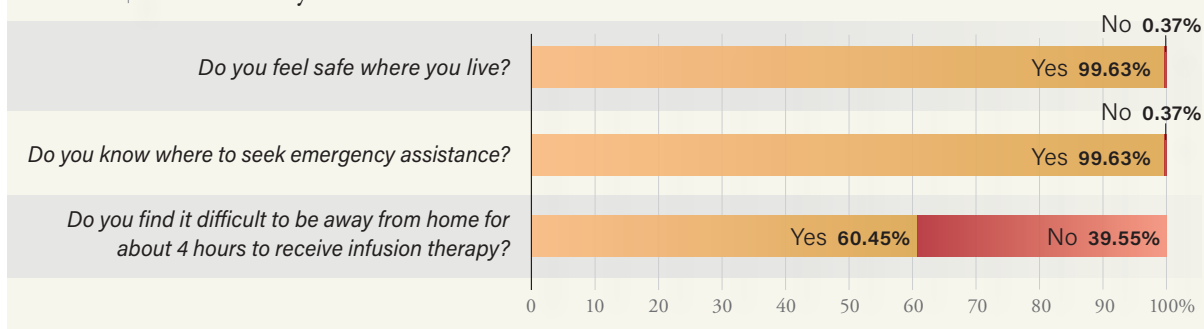
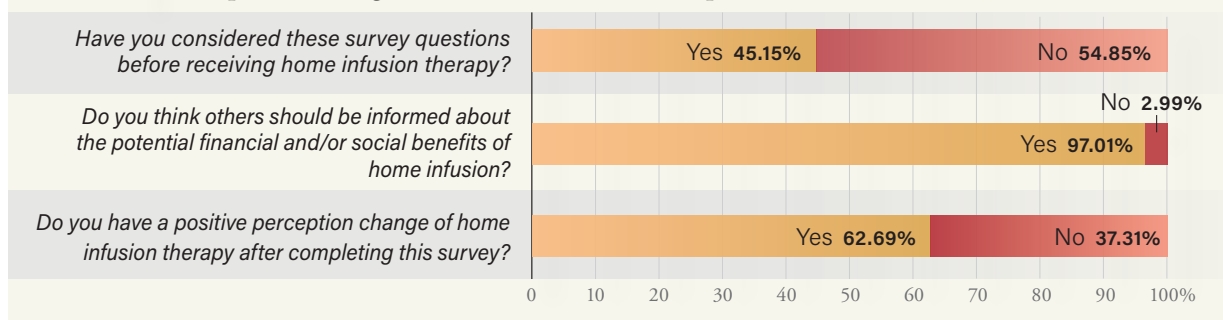


FIGURE 5 | Perception Change of Home Infusion Therapy



6b. Belief That Others Should Be Informed of Home Infusion Benefits

Survey data showed a strong consensus across all racial and regional groups that others should be informed about the potential financial and social benefits of home infusion therapy, with 97.01% (n=260) in agreement and only 2.99% (n=8) expressing disagreement. For those who disagreed, those patients did not provide any reason(s) for their position (Figure 5).

6c. Positive Perception Change After Survey Completion

Regarding shifts in perception change of home infusion therapy after the survey completion, 62.69% (n=168) of patients reported a positive change in how they viewed home infusion therapy after completing the survey, compared to 37.31% (n=100) who did not (Figure 5).

6c-1. Ranking of Perception Change

For patients who reported a positive perception change in home infusion therapy after survey completion, 62.69% (n=168) were asked to rate their positive perception change on a scale from 1-10, with 1 = “Slightly Changed” and 10 = “Greatly Changed.” Overall, patients reported a median perception score of 9 (IQR: 6,10). The most common response was 10, selected by 45.24% (n=76) of patients, compared to 3.36% (n=9) selecting the lowest rating of 1 (Table 8).

TABLE 8 | Perception Change of Home Infusion Therapy – Likert Scale

Survey Item	Median (IQR)	% of Patients Selecting Top Response of "10"
If a Positive Perception, Ranking of Change	9 (6,10)	45.24
1 = Slightly Changed 10 = Greatly Changed		

Discussion

To our knowledge, this is the first study in these patient populations using a hybrid of targeted home infusion therapy questions focused on the influence of Social Determinants of Health Impact on Patient Perception within a home infusion and specialty pharmacy setting. This study finds that home infusion therapy is being perceived positively by patients across diverse demographic groups, including age, race, geographic locations, levels of education, and disease states. Patients specifically identified key benefits in the domains of financial impact, access to care, cultural sensitivity, emotional well-being, and home safety.

The findings further highlight the potential for home infusion to improve patient care and quality of life and reduce the burden on patients and their families and/or caregivers. The widespread positive perception suggests that expanding access to home infusion therapy could improve patient outcomes and improve the efficiency of an already strained health care system, especially in the management of chronic and complex diseases.

Financial Time and Impact

The findings confirm that home infusion therapy is widely viewed as a cost effective and convenient alternative to facility based care. Patients overwhelmingly agreed that receiving treatment at home resulted in significant time and cost savings, with the vast majority selecting the highest possible rating. Home infusion was also viewed as highly supportive of work life balance, with most patients reporting that it helped them better manage personal and professional responsibilities.

Importantly, employment-related barriers to receiving home infusion were minimal, as reflected by low difficulty scores and nearly half of respondents reporting no challenges at all. Together, these results suggest that home-based infusion not only reduces logistical and financial burdens but also integrates more seamlessly into patients’ daily lives compared to facility based care.

Accessibility and Awareness

Based on the findings of the study, several disparities in access, awareness, and caregiving support for infusion therapy patients were identified. While almost three-quarters of patients reported reliable transportation to an infusion center when home infusion was not available, notable gaps emerged. Similarly, a little less than half of patients were aware of their nearest infusion center, with regional differences. Nearly half of patients reported not having a designated caregiver, and a similar proportion indicated they did not have an in-home caregiver. These patterns highlight meaningful variability in caregiver availability and support. Collectively, these findings point to critical areas for intervention, particularly transportation and caregiver support, and underscore the need for targeted outreach and education.

Additional findings from this study highlight disparities in perceived safety, ease of access, and overall confidence in care delivery. More than half of all patients perceived a heightened risk of disease exposure when receiving infusion therapy outside the home. This concern may reflect broader variation in public health messaging, health care infrastructure, or lingering effects of the COVID 19 era, during which heightened awareness of infectious risk contributed to a shift toward home-based care.

Transportation also emerged as a significant barrier for a subset of patients to receive infusion therapy outside of the home with 1 in 5 patients reporting it as “Very Hard” to afford. This suggests potential structural barriers such as transportation deserts, financial constraints, or lack of insurance coverage for infusion therapy. These findings underscore the importance of integrating transportation assistance into infusion care models.

Patients overwhelmingly expressed confidence in the safety and cleanliness of their home environments for infusion with over 80% reporting this perception. In contrast, roughly 26% expressed confidence in the safety and cleanliness of hospitals or infusion centers. Additionally, more than three-quarters of patients reported high confidence in receiving help if complications arose during home infusion therapy, supporting the feasibility and acceptability of home-based care and reinforcing its role as a preferred alternative.

When it came to accessing home infusion supplies over three-quarters of patients reported they never had an issue whereas, about two-thirds of patients expressed issues with receiving infusion supplies for their treatment in the hospital or infusion center. It is worth noting that

issues related to supplies could be attributed to prior providers, manufacturer shortages, or administrative delays, suggesting that both system-level and logistical challenges contribute to patient burden. Also, while hospital/infusion center supply access was lower, recall bias may have influenced responses, as these experiences often reflect care prior to transitioning to home infusion. Moreover, the inability to validate the severity or frequency of reported issues limits definitive conclusions.

Mood Impact

The findings suggest that home infusion therapy significantly enhances patients’ mood and emotional well being. Most patients reported generally positive mood levels, and the majority rated the impact of home infusion at the highest level. These responses indicate that avoiding travel and receiving care in a comfortable environment meaningfully improves emotional well being. Overall, the results show that home-based infusion supports both effective treatment delivery and improved quality of life.

Cultural Understanding

The findings indicate that most patients felt culturally understood by their health care providers, suggesting a generally positive baseline of cultural sensitivity within traditional care settings. However, patients varied in how important they believed cultural understanding to be, with a substantial portion rating it as highly important.

Notably, home infusion therapy was perceived as strongly supportive of cultural understanding. Over half of the patients rated its impact at the highest level, indicating that receiving care in their own home may enhance communication, personalization, and respect for individual values. These results suggest that home-based care not only meets clinical needs but may also create an environment that fosters greater cultural awareness and patient provider connection.

Home Safety

The results indicate that patients generally experience a safe and supportive environment for home infusion therapy. Nearly all participants reported feeling safe in their homes and knowing where to seek emergency assistance, suggesting that safety concerns are minimal and do not pose a barrier to receiving treatment at home. Despite this sense of safety, many patients found it difficult to be away from home for several hours to receive therapy in a facility. Over half reported challenges related to travel, infusion duration, and logistical demands, underscoring the practical burdens associated with facility based care.

Access to fresh food was not a significant concern for most patients, who largely reported that purchasing fruits and vegetables from their home location was not difficult. Only a small minority experienced substantial challenges.

These findings suggest that home infusion therapy aligns well with patients' safety, lifestyle, and environmental needs, reducing logistical strain while supporting overall wellbeing.

Overall Impression of Home Infusion Therapy

The survey findings highlight important disparities and opportunities surrounding awareness and perceptions of home infusion therapy. The findings suggest that while many patients had not initially considered the financial or social implications of home infusion therapy before starting treatment, there was strong agreement that others should be informed about these benefits. Nearly all respondents supported broader awareness efforts, reflecting a shared belief in the value of home-based care.

Importantly, completing the survey itself appeared to influence patient perspectives. A majority reported a positive shift in how they viewed home infusion therapy, and those who experienced this change rated it highly, with a median score of 9. This indicates that increased education and exposure to information may meaningfully enhance patient understanding and appreciation of home infusion services.

The findings of the overall patient perception change of home infusion after this survey illustrated the importance of educational interactions with patients. By improving understanding of home infusion, patients can see the value of home treatment beyond its clinical benefits. Moving forward, expanding these types of questions could play a crucial role in helping more patients make well-informed decisions about their respective treatments.

Limitations

This study does have limitations worth noting, one being the inability to follow-up on certain patient responses which limit the ability to clarify answers or explore complex viewpoints. Also, the timing of the survey administration in relation to treatment could have influenced patient responses. Additionally, reliance on self-reported measures can introduce the risk of recall bias or intentional misreporting, which may affect the accuracy of the findings. Patients may also self-report answers they deemed more acceptable therefore introducing social desirability bias. This study

also had a relatively small sample size, against the total patient population which further restricted the generalizability of results to broader populations. And the cross-sectional design and absence of longitudinal follow-up prevents assessment of temporal changes or causal relationships. Finally, the study population primarily consisted of patients receiving Ig therapy. Patients receiving other types of home infusion treatments (e.g., biologics) may have different needs, challenges, or perceptions, which were not captured in the current analysis; therefore, this restricts the applicability of the findings to the broader home infusion therapy population.

To address the limitations identified in this study, future research should consider methodological improvements. Specifically, incorporate more follow-up opportunities, standardize survey timing, reduce response biases through objective measures, diversify administration methods, increase sample size, and consider longitudinal designs to capture changes over time.

As health care continues to evolve, home infusion therapy is a promising option for patient-centered care that aligns with the preferences and needs of individuals requiring long-term infusion therapy.

Future Directions

Due to the findings of this study, future research should focus on the following:

1. Compare infusion treatment differences in patient perceptions, satisfaction, and long-term clinical outcomes between home infusion providers and traditional settings across broader populations.
2. Conduct cost-benefit analyses for both patient and health care systems (e.g., indirect costs like travel, missed work, caregiver burden, and mental health).
3. Develop and evaluate strategies to mitigate home infusion access barriers, specifically in underserved communities, rural regions, and populations disproportionately affected by transportation, financial, or caregiving limitations.
4. Explore how education and awareness campaigns influence patient understanding, comfort, and adoption of home infusion therapy.
5. Investigate caregiver roles and support needs, including how caregiver availability, training, and burden affect the feasibility and sustainability of home infusion therapy.

Conclusion

This study provides one of the first comprehensive examinations of how social determinants of health shape patient perceptions of home infusion therapy within a specialty pharmacy setting. Across diverse demographic groups, patients consistently viewed home infusion as a beneficial, patient-centered alternative to facility-based care. The results demonstrate clear advantages in financial burden, time savings, work-life balance, emotional well being, cultural sensitivity, and perceived safety, domains that collectively influence treatment experience and overall quality of life.

While the findings highlight strong support for home-based infusion, they also reveal important disparities in transportation access, caregiver availability, and awareness of infusion options. These gaps underscore the need for targeted education, improved care coordination, and supportive services, particularly transportation assistance and caregiver resources, to ensure equitable access to home infusion therapy.

Patients expressed high confidence in the safety and cleanliness of their home environments and reported fewer logistical challenges obtaining supplies at home compared to hospitals or infusion centers. Additionally, many patients experienced a positive shift in their perception of home infusion after completing the survey, emphasizing the value of patient education in shaping understanding and acceptance of home-based care.

Overall, this study suggests that expanding access to home infusion therapy has the potential to enhance patient outcomes, reduce strain on health care facilities, and better support individuals managing chronic and complex conditions. Continued efforts to address access barriers, strengthen patient education, and integrate social determinants of health into care planning will be essential to maximizing the benefits of home infusion therapy for diverse patient populations.

Disclosures: The authors have no financial disclosures or other conflicts of interest to declare.

Data Availability: The data underlying this article will be shared on reasonable request to the corresponding author.

Acknowledgments: Special thank you to Elizabeth Weed, PharmD, BCPP for her contributions to this project.

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