



December 2023

CPSC Staff Statement¹ on Final Report on Qualitative Research on Consumer Usage of Portable Electric Heaters by EurekaFacts

The attached report presents the findings by EurekaFacts on their research study on portable electric heater use and user perceptions conducted under Contract number GS00F211CA, Requisition number CPS-2114-22-0006, September 8, 2022.

According to the US Consumer Product Safety Commission (CPSC), an estimated annual average of 1,700 fires can be attributed to the use of portable electric heaters between 2018 and 2020.² CPSC staff was seeking a better understanding of consumer perception, behavior, and experiences related to the purchase and use of portable electric heaters.

EurekaFacts conducted a qualitative research study of consumer perception, behavior, and experiences related to the purchase and use of indoor portable electric heaters.³ The study emphasized subpopulations that may be prone to higher risk of heater fires. The study used traditional focus group methodology and hybrid focus group methodology (one-on-one interviews and focus groups). The study was not based on a nationally representative sampling; thus, the findings should not be generalized to the entire population or subpopulations of portable electric heater users.

Staff will use this information to inform and develop strategies to improve heater-related safety communications with consumers and standards for portable electric heaters.

¹ This report was prepared by the EurekaFacts under contract with CPSC staff. The report has not been reviewed or approved by, and not represent the views of, the Commission.

² Miller, D. (August 2023) 2018 – 2020 Residential Fire Loss Estimates, U.S. National Estimates of Fires, Deaths, Injuries, and Property Loss from Unintentional Fires, August 2023.

³ The IRB Approval – CPSC – Portable Electric Heaters (IRB No. 2023-2) was approved on March 17, 2023



Consumer Product Safety Commission

Qualitative Research on Consumer Usage of Portable Electric Heaters

Final Report

October 27, 2023

The study was performed on behalf of CPSC under
contract# GS00F211CA, Req.# CPS-2114-22-0006, 9/8/2022

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Prepared in compliance with ISO 20252 International Quality Standard for Market, Public
Opinion and Social Research



Executive Summary

This report presents the findings of a qualitative analysis conducted on focus group discussions regarding the knowledge, practices, and concerns of participants related to the use of portable electric heaters (hereafter referred to as “heaters”). The main objective of the study was to gain insights into participant experiences, preferences, and recommendations for improving the safety, usability, and effective communication about risks and hazards of portable electric heaters. As this study is not based on a nationally representative sample, the findings should not be generalized to the entire population or subpopulations. It is important to note that these findings are not intended to provide national statistics regarding the use of heaters.

The analysis revealed that participants across various populations prioritize safety features and consumer ratings when purchasing heaters. Auto shut-off functions, timers, and smart sensors were identified as critical safety features desired by participants. Usability and effective communication were also highlighted, with participants offering recommendations for clear warning labels, consistent icon labeling, and clearer translations of the icons and of language (non-English to English) to avoid confusion.

Participants frequently mentioned or indicated that “common sense” safety messages were important and appreciated, but also highlighted the need for continued emphasis on these messages. In this context, “common sense” refers to the basic level of understanding and reasoning to make sensible choices and avoiding obvious and potentially dangerous situations. Brightly colored warning labels on product manuals, packaging, and manufacturer websites were recommended to enhance communication and ensure clear instructions. Participants emphasized the need for consistent icon labeling and translations of the icons and of language (non-English to English) to avoid confusion. Additionally, the option of including a remote control for greater accessibility was desirable. Almost half of the participants reported using an extension cord with their heaters, indicating users operate heaters that are not near electric receptacles.

Based on these findings, the report provides the following key observations and recommendations:

1. Auto shut-off functions, timers, and smart sensors in heater designs are features consumers consider or want when purchasing or operating a heater.
2. Clear and visually prominent warning labels on product manuals, packaging, and manufacturer websites, with consistent icon labeling and translations of the icons and of language (non-English to English) for effective communication of safety instructions are helpful to users and consumers in understanding the operation, features, and safety of a heater.
3. Continue to emphasize safety messages, such as avoiding flammable objects and considering child and pet safety.
4. A remote-control option to enhance accessibility and convenience is a feature consumers may consider or want when purchasing or operating a heater.
5. Evaluate safe alternatives or technologies that could potentially make heaters safer when used with extension cords. Continue to raise awareness about the potential risks associated with the use of extension cords with heaters.

In conclusion, this report highlights the importance of safety, usability, and effective communication in the design and marketing of portable electric heaters. By addressing these key aspects, consumers can potentially operate a heater in a safer manner and with reduced hazards, thus potentially reducing injuries with heaters.

Introduction

The U.S. Consumer Product Safety Commission (CPSC) contracted with EurekaFacts to conduct a qualitative research study of consumer perception, behavior, and experiences related to the purchase and use of indoor portable electric heaters (“heaters”). This study emphasized subpopulations that may be prone to higher risk of heater fires. This report focuses on the results from participants’ traditional focus group and hybrid focus groups (one-on-one interviews and focus groups). This study is not based on a nationally representative sample, the findings should not be generalized to the entire population or subpopulations. It is important to note that these findings are not intended to provide national statistics regarding the use of heaters.

Sample

The sample was obtained from the EurekaFacts online database. Participants were recruited in such a way as to obtain feedback from a variety of individuals from the general population, but more importantly individuals that are at higher risk for fires attributed to the use of heaters.

These populations include:

- Older adults (55 years or older)
- Parents/guardians with children five years old or less
- Below the median household income of \$49,999
- Black, Indigenous, and People of Color (BIPOC)
- Spanish speaking (but bilingual to enable focus group participation)

Table 1 displays the sample demographics frequency by session type (traditional or hybrid session):

Table 1. Sample Table by Focus Group Type

	Traditional (n=43)		Hybrid (n=26)		Total Sample (n=69)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Gender						
Male	16	37%	9	35%	25	36%
Female	27	63%	17	65%	44	64%
Age Range						
25 – 34	17	40%	9	35%	26	38%
35 – 44	13	30%	3	12%	16	23%
45 – 54	7	16%	3	12%	10	15%
55 – 64	6	14%	6	23%	12	17%
65 – 74	0	0%	3	12%	3	4%
75 +	0	0%	2	8%	2	3%
Race/Ethnicity						
Asian	5	12%	2	8%	7	10%

	Traditional (n=43)		Hybrid (n=26)		Total Sample (n=69)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Black or African-American	15	35%	6	23%	21	30%
White	19	44%	15	58%	34	49%
Two or more races	2	5%	1	4%	3	4%
Another race	4	9%	0	0%	4	6%
Hispanic						
No, not of Hispanic, Latino or Spanish origin	29	67%	25	96%	54	78%
Yes, another Hispanic, Latino, or Spanish Origin	4	9%	0	0%	4	6%
Yes, Cuban	1	2%	0	0%	1	1%
Yes, Mexican, Mexican American, Chicano	8	19%	1	4%	9	13%
Yes, Puerto Rican	1	2%	0	0%	1	1%
Income						
Less than \$20,000	2	7%	8	31%	10	15%
\$20,000 to \$29,999	2	7%	1	7%	3	4%
\$30,000 to \$39,999	3	7%	0	0%	3	4%
\$40,000 to \$49,999	1	2%	7	27%	8	12%
\$50,000 to \$59,999	7	16%	1	7%	8	12%
\$60,000 to \$69,999	6	14%	0	0%	6	9%
\$70,000 to \$79,999	7	16%	3	12%	10	15%
\$80,000 to \$89,999	3	7%	1	7%	4	6%
\$90,000 to \$99,999	1	2%	1	7%	2	3%
\$100,000 or more	11	26%	4	15%	15	22%
Education						
High school diploma or GED	2	7%	2	8%	4	6%
Some college, no degree	12	28%	3	12%	15	22%
Trade or vocational school degree	2	7%	1	4%	3	4%
Two-year associate degree from a college or university	4	9%	5	19%	9	13%
Four-year college or university degree/bachelor's degree	13	30%	10	38%	23	33%
Some postgraduate or professional schooling, no postgraduate degree	1	2%	1	4%	2	3%
Postgraduate or professional degree	8	19%	5	19%	13	19%
Household Type						
Apartment or Condo	12	28%	10	38%	22	32%
Mobile or trailer home	2	7%	0	0%	2	3%
Single-family detached home	24	56%	16	62%	40	58%

	Traditional (n=43)		Hybrid (n=26)		Total Sample (n=69)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Townhome or row house multiple family attached home	5	12%	0	0%	5	7%
Parent/Guardian						
Yes	25	58%	12	46%	37	54%
No	15	35%	17	65%	32	46%
Geographic Region⁴						
Midwest	14	33%	8	31%	22	32%
Northeast	4	9%	4	15%	8	12%
South	18	42%	11	42%	29	42%
West	7	16%	3	12%	10	15%

Recruitment and Screening

EurekaFacts recruited a diverse cross-section of Portable Electric Heater (“heater”) users from the EurekaFacts participant database. The recruitment activities focused on populations that are at an increased risk of death or injury due to the use of heaters. EurekaFacts collaborated with the CPSC to create a participant screening tool that gathered needed data as a way to schedule a demographically diverse mix of participants who met the study criteria. The screening questionnaire ensured a diverse mix of socioeconomic status, educational attainment levels, race and ethnicity, gender, ages (18-75 years old), urbanicity (urban, rural, suburban residency) and adults with and without children.

EurekaFacts utilized its own participant database, which was generated through prior studies and with the participants’ permission to be contacted for interest in participating in future studies. Participants were sent an initial invitation email that explained the study and linked them to the screener. Participants were sent a second follow up email if sufficient responses were not received. Participants were then screened for owning at least one heater for at least seven years and have used the heater within the last twenty months, specifically for one or more of these eligibility requirements:

- Consumers that are over the age of 55 years old
- Consumers that are parents/guardians with children four years old or less
- Consumers that are below the median household income
- Consumers that are BIPOC (Black, Indigenous, and People of Color)
- Consumers that are Spanish speaking (but bilingual to enable focus group participation)

Once respondents completed the screener and were deemed eligible, EurekaFacts used multiple outreach/contact methods to schedule, confirm, and remind participants about the focus group sessions. Contact methods included scheduling emails, confirmation emails, reminder text messages, and reminder phone calls to ensure participation.

⁴ Regions are categorized using the U.S. Census: [us_regdiv.pdf \(census.gov\)](https://www.census.gov/regdiv/regdiv.pdf)

Key Findings

Overall, the below findings emerged from the results of this study:

Table 2. Key Findings

Topic	Finding
Knowledge and Practices	- Participants are knowledgeable and use safe practices when it comes to using their heater, especially as it relates to: - Fire safety, such as keeping heaters clear of flammable objects. - Not leaving heaters unattended. - Being deliberate of where they place their heater. - Participants typically own one to three heaters, which may have features such as fans, plastic or metal casings, and a glowing red indicator when turned on. - Heater usage is typically influenced by colder weather conditions, particularly during winter and fall, and most participants reported using their heaters for a few hours daily, typically in the evening, followed by mornings then afternoons. - Participants are knowledgeable about safety precautions, particularly regarding fire safety, and generally report positive experiences with their heaters, with any issues being easily resolved. - Participants find warning labels on their heaters helpful but suggest improvements such as clearer icons with accompanying words and clearer communication about the need for general maintenance.
Use and Behaviors	- Participants prioritize safety features and consumer ratings when making decisions about purchasing heaters. - Safety features and energy efficiency are the top factors influencing participants' choices when purchasing heaters. - Participants heavily rely on online product reviews for information about heaters but tend to overlook recall notices unless they are specifically alerted to them. - Participants reported using an extension cord with their heaters, indicating the heaters are used in areas that are not near receptacles.
Decision Making	- Participants emphasize the importance of safety features in heaters, specifically auto shut-off functions, and timers, as well as the inclusion of smart technology and sensors to detect potential overheating issues. - Participants found and wanted effective communication through bright warning labels on product manuals, packaging, and manufacturer websites. Consistent icon labeling and clear translations of the icons and of language (non-English to English) to avoid confusion were also mentioned. - Participants appreciate the option of having a remote control for greater accessibility.

Background

According to the US Consumer Product Safety Commission (CPSC), between 2016 and 2018 an estimated annual average of 1,700 fires can be attributed to the use of portable electric heaters.

FEMA, in their article addressing “Fire Risk in 2019,” identified several factors that contribute to fire deaths, including race, age, gender, and residential location. More specifically, fire death rates are higher in states with larger populations of African Americans, people living in poverty, people with less formal education, and rural dwellers. Many of the states with higher percentages of those at risk of injury or death due to fire are in the Midwest and south. Higher rates of death due to fire in southern states may be due to the intermittent need for heating, resulting in use of portable heating devices as a primary heating source.

The study objective was to gain insights into participant experiences, preferences, and recommendations for improving the safety, usability, and information of heaters. As this study is not based on a nationally representative sample, the findings should not be generalized to the entire population or subpopulations. It is important to note that these findings are not intended to provide national statistics regarding the use of heaters.

As a result of these findings, CPSC was seeking an understanding of consumer perception, behavior, and experience related to the purchase and use of portable electronic heaters (“heaters”) to inform strategies to improve heater-related safety communications with consumers and possibly improvement to the safety standards for heaters.

Sample

A total of 69 individuals took part in remote traditional focus group sessions and hybrid focus groups (one-on-one interviews and group discussions). The study comprised seven traditional focus groups, and six hybrid focus groups.

The sample of participants were organized into homogenous groups according to certain demographics (Table 3). Table 4 and Table 5 show the demographics represented within each group:

Table 3. Sample Criteria and Breakdown

Session/Population	Criteria
Session 1A: BIPOC Session 1B: BIPOC	Within the self-screener, the participant reported identifying as Black, Indigenous, or a Person of Color (Asian, Hispanic).
Session 2A: Hispanic Session 2B: Hispanic Session 2C: Hispanic	Within the self-screener, the participant reported “yes” to any of the Hispanic categories. Also reported if the individual speaks Spanish fluently or not.
Session 3A: Parents Session 3B: Parents	Within the self-screener, the participant reported “yes” to being a parent, specifically to a child 5 years or younger. Parents who indicated having children under 18 were also included.
Session 4A: Older Adults Session 4B: Older Adults	Within the self-screener, the participant reported to being 55 years or older.
Session 5A: Income below \$49,999 Session 5B: Income below \$49,999	Within the self-screener, the participant reported to having an annual income lower than \$49,999.
Session 6A: General Population Session 6B: General Population	No specific criteria. Mix of all the above.

Table 4. Master Demographics by Session (Gender, Age, and Race/Ethnicity)

[illegible]

Table 5. Master Demographics by Session (Income, Education Level)

Participant Demographics	1A (n=9)	1B (n=6)	2A (n=7)	2B (n=4)	2C (n=3)	3A (n=3)	3B (n=5)	4A (n=2)	4B (n=5)	5A (n=6)	5B (n=5)	6A (n=8)	6B (n=6)	Total (n=69)
Income														
Less than \$20,000	1	0	0	1	0	1	0	0	0	5	2	0	0	10
\$20,000 to \$29,999	0	0	0	1	0	0	0	0	0	1	0	1	0	3
\$30,000 to \$39,999	2	0	0	0	0	0	0	0	0	0	0	0	1	3
\$40,000 to \$49,999	0	0	0	1	0	1	1	0	2	0	3	0	0	8
\$50,000 to \$59,999	1	3	0	0	0	0	1	0	0	0	0	1	2	8
\$60,000 to \$69,999	1	1	2	0	0	0	0	0	0	0	0	2	0	6
\$70,000 to \$79,999	2	0	0	1	1	1	2	0	0	0	0	2	1	10
\$80,000 to \$89,999	0	1	2	0	0	0	0	0	1	0	0	0	0	4
\$90,000 to \$99,999	0	1	0	0	0	0	0	0	1	0	0	0	0	2
\$100,000 or more	2	0	3	0	2	0	1	2	1	0	0	2	2	15
Highest Education Attainment														
High school graduate or GED equivalent	0	0	1	0	0	1	0	0	0	1	0	1	0	4
Some college, no degree	4	1	1	1	1	0	1	0	0	2	0	1	3	15
Trade or vocational school degree	0	0	2	0	0	1	0	0	0	0	0	0	0	3
Two-year associate degree from a college or university	2	0	0	1	1	0	0	0	1	2	1	1	0	9
Four-year college or university degree/bachelor's degree	3	4	1	2	0	0	4	0	3	0	3	3	0	23
Some postgraduate or professional schooling	0	0	0	0	0	0	0	0	0	1	0	0	1	2
Postgraduate or professional degree	0	1	2	0	1	1	0	2	1	0	1	2	2	13

Study Design

Methodology

EurekaFacts used an approach that provided a comprehensive evaluation of the critical processes involved in processing and understanding warning or caution communications, and the methodology provided information sufficient to improve the effectiveness of heater caution messages. This comprehensive approach was conducted within a study design that involved a hybrid evaluation session, incorporating two different methods: cognitive or contextual interviews and focus group discussions. These two methods achieved two different research goals:

- **Knowledge and Practices:** Cognitive interviews and four focus group discussions explored consumer understanding and perceptions of risks involved in using heaters, usage patterns, and consumer knowledge about the maintenance and safety of heaters. The number and type of heaters owned by participants was also identified.
- **Decision Making:** Focus group discussions further examined past experiences with heaters, including any incidents or problems with heaters; explored decision making processes for purchasing a heater; and helped to generate ideas for caution or warning communications that meet the needs of different audiences.

There were a total of seven (7) traditional groups. Four (4) of the traditional focus groups explored knowledge and practices. The remaining three (3) traditional focus groups explored decision making for the purchase of heaters. These traditional groups also provided feedback and answers on the effects of caution warnings as well as generated ideas for cautionary messaging. The six (6) hybrid sessions explored knowledge and practices, decision making processes, the influence of caution warnings, and generated ideas for caution messaging. Table 6 exhibits the methodology by session. Table 7 further displays the breakdown of topic to population.

Table 6. Methodology by Sessions

Methodology	Knowledge and Practices	Decision Making
Traditional Focus Groups	4 Focus Groups (n=19)	3 Focus Groups (n=24)
Hybrid Groups	6 hybrid groups (n=26)	

Table 7. Counts per Session by Focus Group Type and Subpopulation

Subpopulation	Topic of discussion	<i>Traditional Focus Group</i> (n = 43)	<i>Hybrid Focus Group</i> (n = 26)
Session 1A: BIPOC	Knowledge and Practices; Decision Making	9	-
Session 1B: BIPOC	Knowledge and Practices; Decision Making	6	-
Session 2A: Hispanic	Decision Making	7	-
Session 2B: Hispanic	Knowledge and Practices	4	-
Session 2C: Hispanic	Knowledge and Practices	3	-
Session 3A: Parents	Knowledge and Practices; Decision Making	-	3

Subpopulation	Topic of discussion	<i>Traditional Focus Group</i> (n = 43)	<i>Hybrid Focus Group</i> (n = 26)
Session 3B: Parents	Knowledge and Practices; Decision Making	-	5
Session 4A: Older Adults	Knowledge and Practices; Decision Making	-	2
Session 4B: Older Adults	Decision Making	-	5
Session 5A: Income below \$49,999	Knowledge and Practices	-	6
Session 5B: Income below \$49,999	Decision Making	-	5
Session 6A: General Population	Decision Making	8	-
Session 6B: General Population	Knowledge and Practices	6	-

Data Collection Procedure

Data collection followed standardized policies and procedures to protect participants' privacy, security, and confidentiality. Digital consent was obtained via online digital forms prior to the focus group session for most participants. However, participants who did not return a consent form before their scheduled session were reminded to complete the online consent form immediately prior to beginning the session. The consent forms are stored separately from participant interview data and are secured for the duration of the study. The consent forms will be destroyed three years after the final report is released.

Coding and Analysis

The focus group and one-on-one interview sessions were audio and video recorded using the virtual online platform record meeting function. After each session, a coder utilized standardized data-cleaning guidelines to review the recording and transcripts to produce a code book containing the codification of all transcripts of each participant's commentary and behaviors. Completely anonymized, transcriptions and observations tracked each participant's contributions from the beginning of the session to its close. As the first step in data analysis, coders' documentation of the sessions into the code book included only records of verbal reports and behaviors, without any interpretation. The code book was created by reviewing the focus group transcripts, identifying recurring themes, and developing a set of codes to represent those themes.

After the code book was completed, it was reviewed by two reviewers. One reviewer cleaned the code book by reviewing the audio/video recording to ensure all relevant contributions were captured. In cases where differences emerged, the reviewer and coder discussed the participants' narratives and their interpretations thereof, after which any discrepancies were resolved. The second reviewer conducted a spot check of the code book to ensure quality and final validation of the data captured.

Once all the data was cleaned and reviewed, research analysts began the formal process of data analysis which involved using the code book as a reference during the coding process to identify major themes, trends, and patterns in the data and taking note of key participant behaviors.

Specifically, analysts were tasked with classifying patterns within the participants' ideas in addition to documenting how participants justified and explained their actions, beliefs, and impressions.

Each topic area was analyzed using the following steps:

1. **Getting to know the data** – Several analysts read through the code book and viewed the video recordings to become extremely familiar with the data. Analysts recorded impressions, considered the usefulness of the presented data, and evaluated any potential biases of the interviewers.
 2. **Focusing on the analysis** – The analysts reviewed the purpose of the study and research questions, documented key information needs, and focused the analysis by question or topic.
 3. **Categorizing information** – The analysts gave meaning to participants' words and phrases by identifying themes, trends, or patterns.
 4. **Developing codes** – The analysts developed codes based on the emerging themes to organize the data. Differences and similarities between emerging codes were discussed and addressed in efforts to clarify and confirm the research findings.
 5. **Identifying patterns and connections within and between categories** – Multiple analysts coded and analyzed the data. They summarized each category, identified similarities and differences, and combined related categories into larger ideas/concepts. Additionally, analysts assessed each theme's importance based on its severity and frequency of recurrence.
- Interpreting the data** – The analysts used the themes and connections to explain findings and answer the research questions. Credibility was established through analyst triangulation, as multiple analysts cooperated to identify themes and to address differences in interpretation.

Limitations

Qualitative research, while providing valuable insights into human behaviors and experiences, faces certain limitations. One significant constraint is its limited generalizability due to small sample sizes and context-specific findings. Moreover, researchers must be cautious of potential social desirability bias, where participants may provide responses they perceive as socially desirable, leading to less authentic and accurate data.

The sample size for the study is $n=69$, which means that there were sixty-nine participants involved in the focus group. However, when analyzing the responses, it is possible for the total number of responses to exceed or not add up to the sample size for a few reasons. First, it is important to note that each participant might have provided multiple responses or mentioned multiple themes during discussion. Therefore, the total numbers of responses may be larger than the sample size.

Also, some participants may not have responded to certain themes or questions. This could result in a discrepancy between the total number of responses and the sample size. For example, if one participant did not answer a particular question, the total number of responses for that question would be lower than the sample size. Despite careful efforts, there may also be discrepancies that

arise due to unintentional misinterpretation of responses, accidental omission, or other inadvertent oversights. Recognizing the potential for human error and to safeguard against this potential, the research team implemented the use of specialized software, which provides a systematic and organized approach to the data analysis, allowing for consistent and reliable coding of responses. By utilizing the software, the team aimed to minimize errors and enhance the accuracy and integrity of the analysis process.

Online focus groups, while offering convenience and accessibility, are not without their limitations. One significant drawback is the limited availability of nonverbal cues, such as facial expressions and body language, which are crucial for gaining a comprehensive understanding of participants' emotions and reactions. This can hinder the depth of insights obtained compared to in-person sessions. Additionally, technical issues, including participants' varying levels of technological proficiency, access to stable internet connections, and familiarity with the online platform, can introduce biases and affect the representativeness of the sample, potentially impacting the reliability of the data collected. Moreover, moderating an online focus group presents its challenges, as communication delays and difficulties in managing group dynamics may arise, necessitating new skills for effective facilitation in a virtual environment. Finally, the demographic mix of participants within this study, especially the fact that a large percentage of participants (22%) have taken post-graduate level courses or completed a graduate degree, is a limitation that makes the findings even less generalizable. Despite these limitations, careful consideration of these factors and adaptation of the research design can still yield valuable qualitative data and insights.

Findings

Participants were asked questions and probes to explore consumer understanding and perceptions of risks involved in using portable electric heaters ("heater"). There were four main topics of discussion:

- **Knowledge and Practices:** look at usage patterns, such as types of heaters and conditions, as well as consumer knowledge about the maintenance and safety of heaters.
- **Use and Behaviors:** look further into usage patterns and behaviors associated with these usage patterns.
- **Decision Making:** examine past experiences with heaters, including any incidents or problems with heaters; explore decision making processes for purchasing a heater; and generate ideas for caution or warning communications that meet the needs of different populations.
- **Closing Comments:** participants were able to comment on advantages and concerns about heaters, as well as give suggestions for safer heaters.

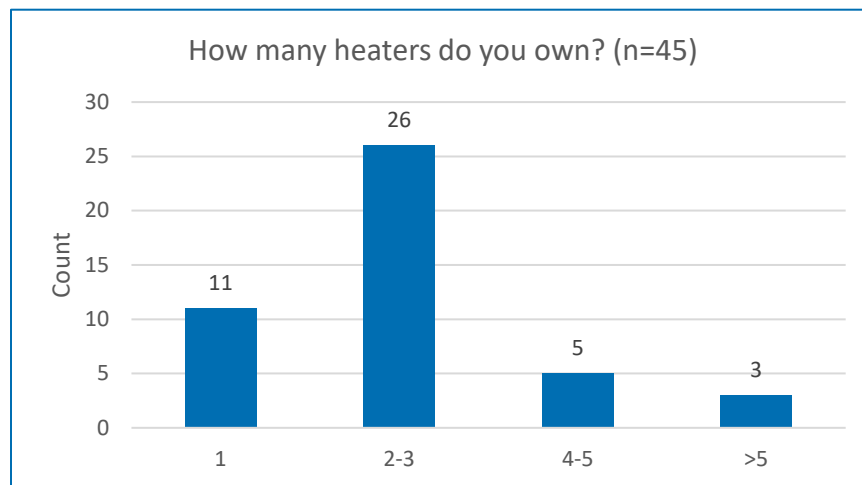
Knowledge and Practices

Participants were asked a variety of questions and probes regarding their usage patterns, such as types of heaters and conditions, as well as knowledge about the maintenance and safety of heaters.

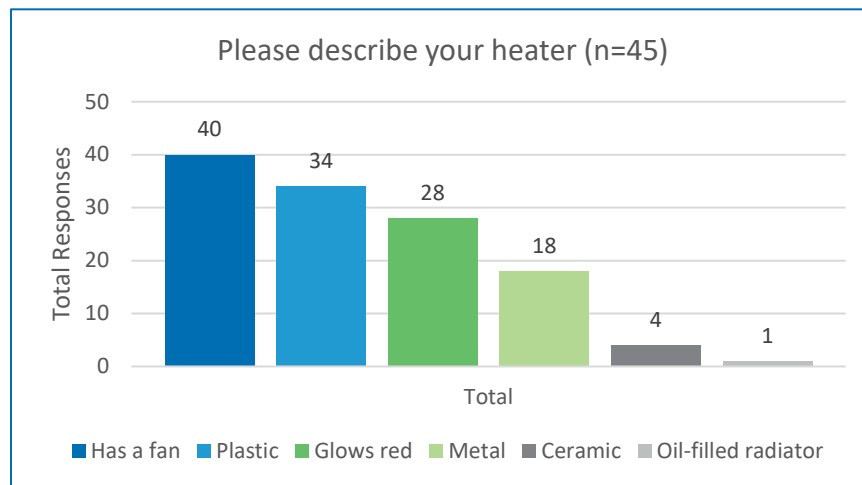
Types of Portable Electric Heaters

Across Knowledge and Practices groups and hybrid groups, 45 participants were asked questions on the number and type of portable electric heaters (“heaters”) owned by participants, revealing that over half (n=26) own two or three heaters. About one-fourth (n=11) own one heater. Five participants shared that they own four or five heaters. The remaining three participants own more than five heaters. This includes one participant, in the Older Adults group, who was not too sure on exact number of heaters they own, “I think it’s more than five.” Figure 1 displays the results of heaters owned reported by participants.

Figure 1. Number of heaters owned



Participants were then asked to describe their heater(s). Participants reported having multiple of the specified attributes such as their heaters having a fan, is in plastic or metal casing, is it an oil-radiator type, or if it glows red when turned on. A majority of the participants (n=40) stated that one or more of their heaters has a fan. Three-fourths (n=34) reported that the outside casing was made of plastic, whereas the remaining quarter (n=18) reported that the outside casing was made of metal. Fewer than half (n=28) reported that their heaters glows red when turned on. Four participants reported that their heater was ceramic. One participant, within the Income below \$49,999 group, reported having an oil-filled radiator type of heater. Figure 2 displays the descriptors of heaters reported by participants.

Figure 2. Descriptors of heaters

In addition, participants also described supplemental physical attributes of their heaters, such as size and color, and capabilities or accessories. As for the capabilities, a few participants mentioned that they have oscillating heaters. For accessories, a few participants reported their heaters came with a remote control.

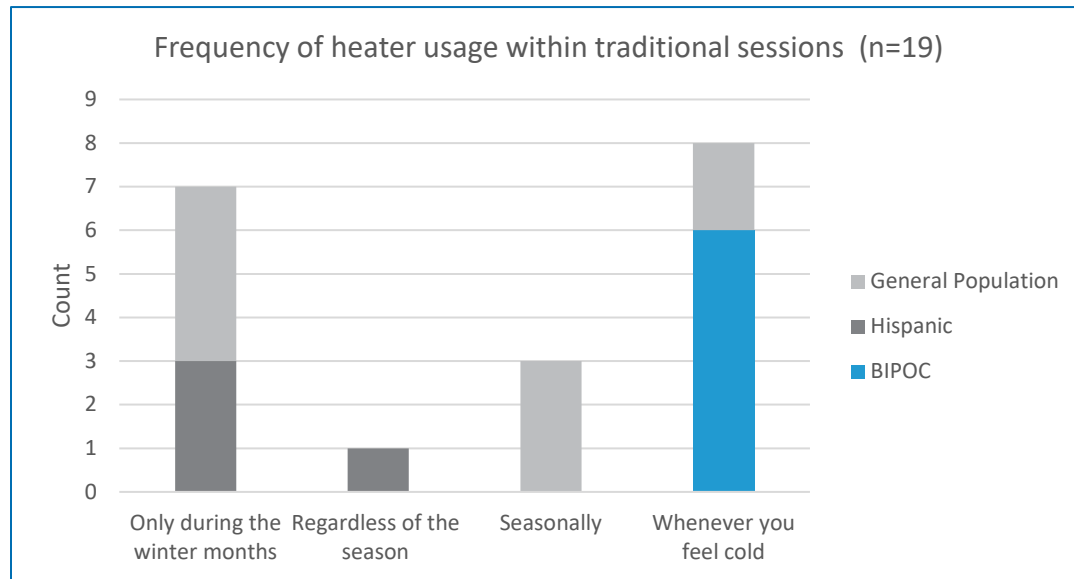
In summary, participants typically own one to three heaters. Most of these heaters have a fan, are plastic, and glow red when turned on. Only one participant reported using an oil-filled radiator type of heater.

Conditions for Use

After describing their heaters, participants were asked several questions about conditions when they use heaters, such as frequency of use by month, time of day, and hours in the day.

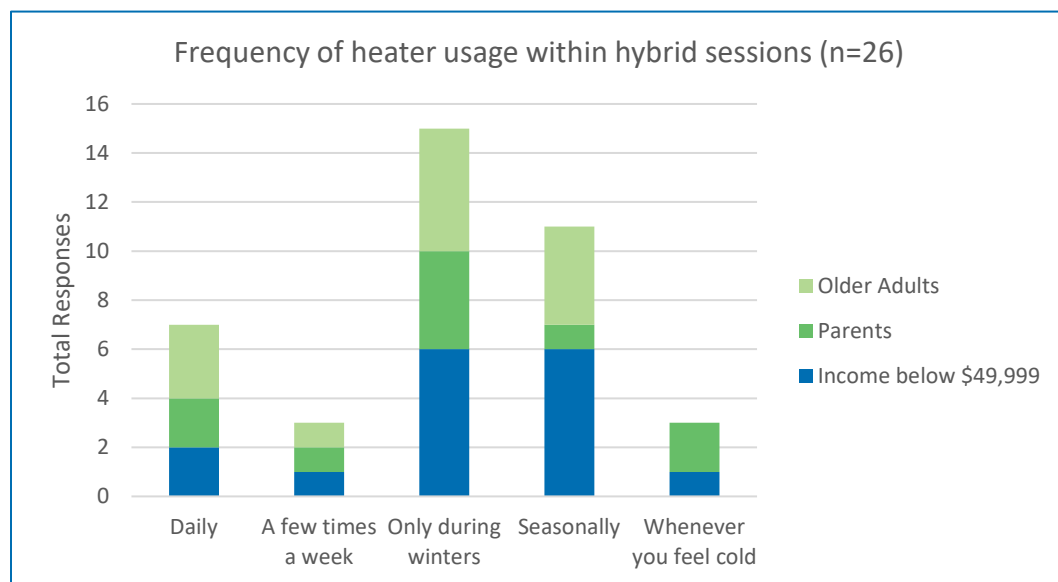
Participants within the traditional Knowledge and Practices groups (n=19) sessions were prompted with a poll question ("How often do you use your portable electric heaters?"). Participants were asked to specify how often they utilize these heaters, with response options ranging from "all the time, regardless of the season," "only during the winter months," "whenever you feel cold," and "seasonally." These responses represent the frequency with which a participant responded to the question within all Knowledge and Practices groups, rather than representing the number of individual participants. Figure 3 displays the traditional focus group session (Hispanic, General Population, BIPOC) results to the survey question.

Figure 3. Frequency of heater usage reported by specific populations (traditional sessions)



As for the hybrid sessions (n=26), participants were surveyed the same question. A few participants may have selected more than one of the response options due to the nature of one-on-one sessions. Further, participants also explained that they may use their heaters “daily” (multiple times a day) or “a few times a week” (two to four days). Figure 4 displays the results of the hybrid one-on-one interviews (Older Adults, Parents, Income below \$49,999) to the survey question. Due to the response options, participants may have selected more than one response.

Figure 4. Frequency of heater usage reported by specific populations (hybrid sessions)

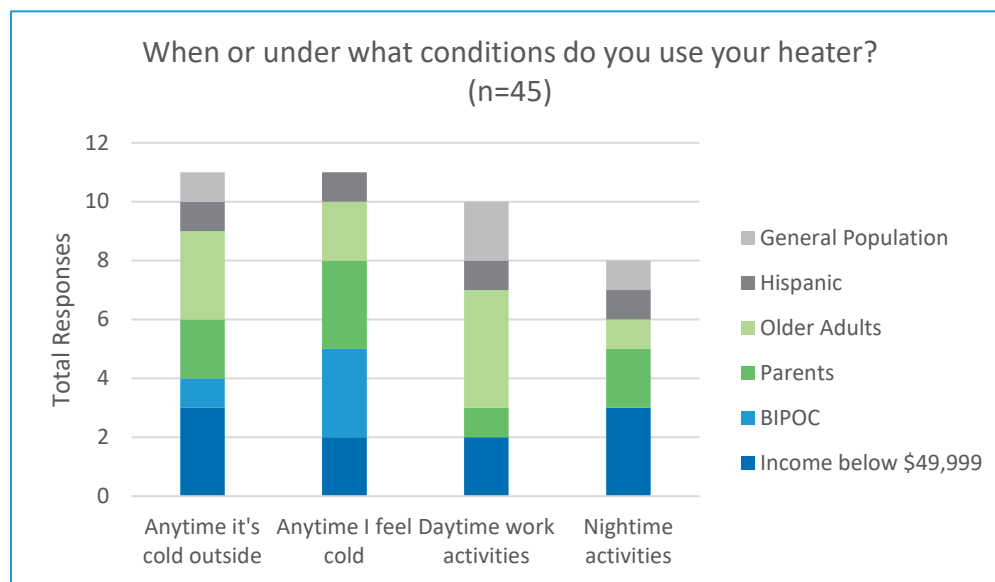


Comparing responses from all groups and populations (Figures 3 and 4), a total of 45, “only during winters” (n=22) and “seasonally” (14 out of 45) are the top two reported frequencies

when participants use their heaters. “Whenever you feel cold” is the third most reported frequency of usage (n=11) amongst all the populations.

These three reported frequencies connect to responses when diving deeper into the conditions in which their heaters are used. Participants across all populations emphasized that they use their heaters when it is cold outside (e.g., during the winter) or anytime they feel cold. In addition, participants reported the general time of day when they use their heaters. “Daytime work activities” has a higher count by one in comparison to “Nighttime activities.” Figure 5 displays participants’ reports of under what conditions they use their heaters. These responses represent the number of times participants responded to the question, rather than the number of participants.

Figure 5. Conditions for using heaters



In relation to frequency of usage and the conditions during which heaters are used, participants within the traditional Knowledge and Practices groups (n=19) and hybrid sessions (n=26) noted the specific months, or outside temperatures, when they use their heaters. The months have been categorized into seasons: winter (December to February), spring (March to May), summer (June to August), and fall (September to November). In addition, responses were grouped by the four regions (Midwest, Northwest, South, and West)⁵.

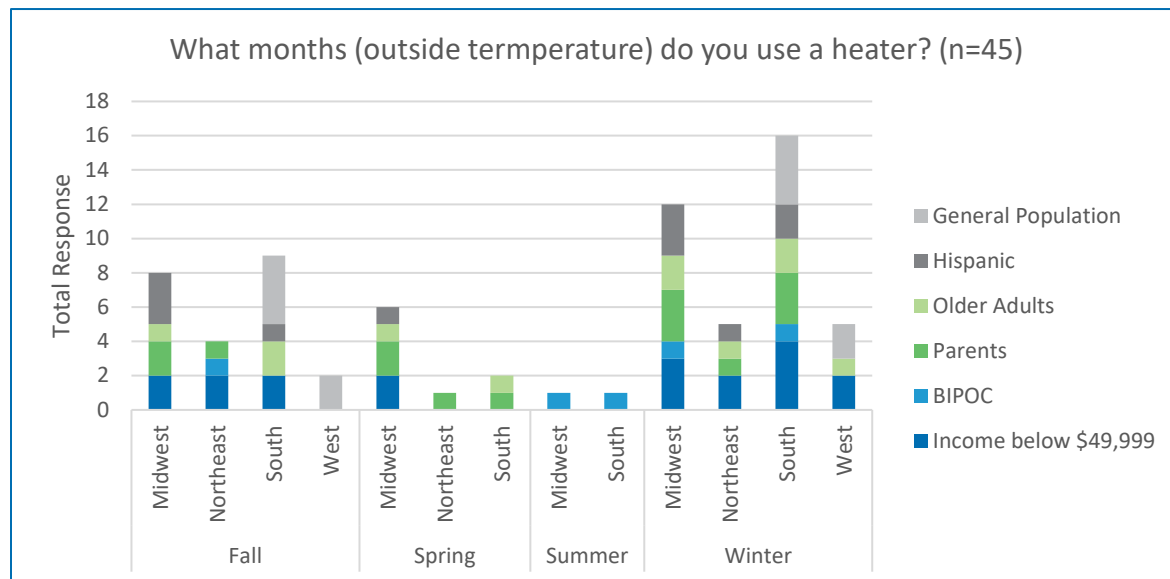
It is no surprise that winter is the seasonal period in which heaters are most often used, however participants also noted fall and spring months for using their heaters. Several participants that noted using heaters in the fall and winter and/or spring months, too, depending on where an individual resides (e.g., Northern states). One participant [PEH016], who resides in Michigan, explained, “So, starting anywhere from October, all the way till March, April, depending.” Two participants, within the same BIPOC group, admitted to recently using their heaters (summer

⁵ The U.S. Census Bureau defines four (4) regions and nine (9) divisions: [us_regdiv.pdf \(census.gov\)](https://www.census.gov/regdiv/regdiv.pdf). EurekaFacts used the four regions defined by the U.S. Census in the paragraph and Figure 7.

months). Note that these responses represent the number of responses, rather than the number of participants. Figure 6 showcases reported seasons by region heaters are used across all the populations.

*So, starting anywhere from October, all the way till March, April, depending.
(25-34, Asian, Non-Parent, Less than \$20,000)*

Figure 6. Seasonal months (outside temperatures) heaters are used by region



Participants across all groups and populations (n=69) were also inquired on what time of day they mostly use their heaters. Participants reported mostly using their heaters in the evenings (n=28) with mornings (n=21) being second. One participant [PEH402], within the BIPOC group, captured the essence of using the heaters for a few hours to get enough warmth, “About the same for me, a couple of hours and usually whenever I feel cold, but usage is mostly daytime when I’m in the office.” Eight participants reported mostly using their heaters in the afternoon.

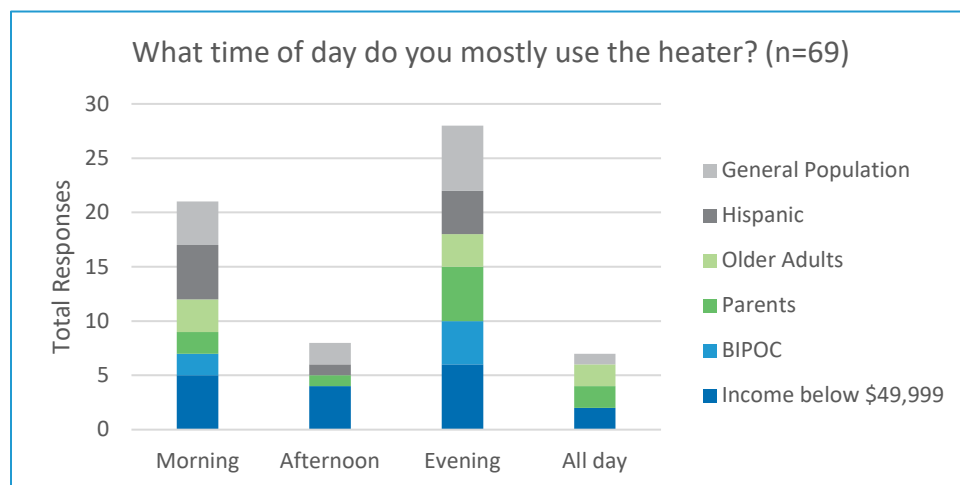
About the same for me, a couple of hours and usually whenever I feel cold, but usage is mostly daytime when I’m in the office.

(25-34, Asian, Non-Parent, \$60,000 to \$69,999)

Interestingly, seven participants reported using it all day. One participant [PEH016] explained that the heater is their main source of heat, hence having it on all day, “It’s basically on kind of all day. The heaters at my apartment don’t work well, so I kind of use the space heaters right now as my main source, even though the heaters do work.” Similarly, another participant [PEH1047] explained that they have the heaters on all day due to owning two heaters and working from

home. They also note safety usage of not leaving them run all the time and emphasize the timer features on two of their heaters. Figure 7 highlights reported time of day heaters are used across all the populations. Note that the figure represents the number of responses, rather than the number of participants.

Figure 7. Time of day use heaters



Participants (n=45), particularly in the traditional Knowledge and Practices groups and hybrid sessions, were asked typically how long they leave on their heaters. Among participants that were able to report typical hour usage, 2 to 3 hours was the highest reported (n=20). Interestingly, the BIPOC population has the highest count (n=6) for using their heaters for two to three hours and did not report for the other time ranges. For example, one participant [PEH091] of the BIPOC group stated, “For me, I usually use it whenever I feel cold, so it really doesn't really matter the season or month or whatever. I normally use it mainly overnight. And also, I would say I have it on the timer normally between one and two hours.”

For me, I usually use it whenever I feel cold, so it really doesn't really matter the season or month or whatever. I normally use it mainly overnight. And also, I would say I have it on the timer normally between one and two hours.

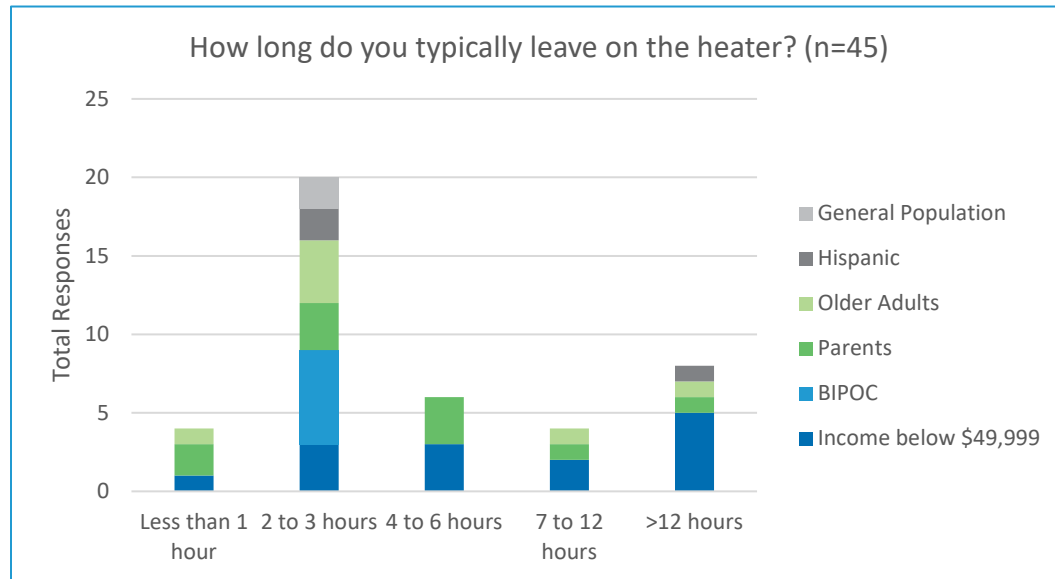
(35-44, African American, Parent, \$60,000 to \$69,999)

The second highest usage reported by participants is more than 12 hours (8 out of 45). Delving deeper into patterns across populations, we see participants within the Income below \$49,999 group have a higher count (n=5) for using their heaters for more than 12 hours compared to the other populations. For most they bluntly stated, “almost 24 hours.” One participant [PEH450] admitted to the hazard of leaving their heaters on overnight but with a precaution, “To be honest, well majority at nighttime. But I will keep it on all day if someone's home. So, it could go anywhere from 24 hours to 12 hours?”

However, there are cases in which time usage varies for individuals (less than one hour or 2 to 3 hours). For example, one participant [PEH311] within the Income below \$49,999 population

explained, “There are times when you'll have it on for several hours in a row and other times when you only need it for 15 minutes.” Figure 8 displays the results across all the populations about how long heaters are typically left on. Note that the figure represents the number of responses, rather than the number of participants.

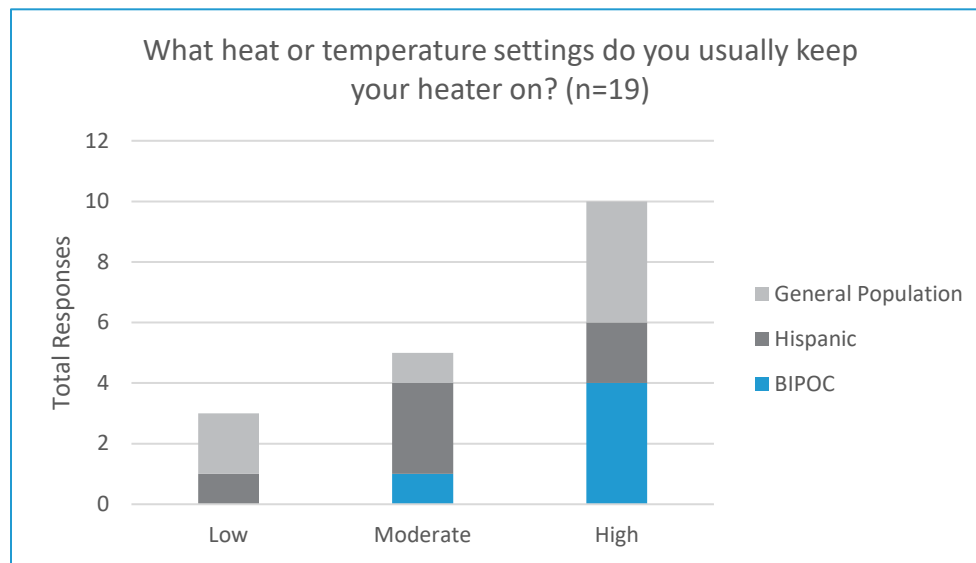
Figure 8. How long is heater typically left on



Participants within all the traditional Knowledge and Practices groups (n=19) were explicitly asked what temperature they preferred to set their heaters. These were categorized into three settings: low (below 68°F), moderate (68°F to 72°F), and high (above 72°F). More than half of the participants (10 out of 19) reported setting their heaters on high. More than one-quarter of the participants (5 out of 19) reported setting their heaters on the moderate setting. Three participants set their heaters to the lowest setting. One participant [PEH929], within the Hispanic group, does not recall the temperature they set their heaters. The remaining two participants were vague in their response. Similarly, another participant [PEH066], within the Hispanic group, shared, “Yeah, I would say it would kind of be dependent on how much I want to try to increase the air temperature in the room. I don't really have a set one that I turn it on to each and every time.” Figure 9 demonstrates the results across the traditional sessions (General Population, Hispanic, and BIPOC) of preferred temperature of their heaters. It is important to note that these responses represent the number of times a temperature setting was mentioned within all Knowledge and Practices sessions, rather than the number of participants.

Yeah, I would say it would kind of be dependent on how much I want to try to increase the air temperature in the room. I don't really have a set one that I turn it on to each and every time.

(35-44, Hispanic, Parent, \$100,000 or more)

Figure 9. Temperature setting of heaters

In summary, regardless of population, participants typically use their heaters when the conditions outside are colder (e.g., winter and fall months) or when they feel cold. As for the time of day when heaters are used, it is normally in the evening for two to three hours. Lastly, participants usually set their heaters to the highest setting (above 72°F) and the moderate setting (68°F to 72°F) once their area is comfortably heated or to maintain a constant comfortable warmth.

Use of Heaters to Dry Items

The Knowledge and Practices groups (n=19) were asked explicitly about whether they use the heaters to dry items (e.g., clothes, shoes, curtains, etc.). Of those that answered this question (n=16), the majority (n=13) responded that they do not place any items on their heaters to dry. The remaining three participants, all within the General Population group, responded that they do put an item *in front* of their heaters temporarily to dry. As one participant [PEH1072] shared, “We don't put anything on ours, but we do put wet boots or shoes, like the kids' shoes and stuff go in front of them if it's not sunny. Otherwise, we just set them outside.”

We don't put anything on ours, but we do put wet boots or shoes, like the kids' shoes and stuff go in front of them if it's not sunny. Otherwise, we just set them outside.

(35-44, White, Parent, \$70,000 to \$79,999)

Most of the participants are knowledgeable in not using their heaters to dry items. However, in some cases, participants are cautious to place the item in front of the heater, rather than on it.

Maintenance of Heaters

Participants within the Knowledge and Practices groups (n=19) and hybrid sessions (n=26) were inquired on actions or steps they take to keep their heater running efficiently and effectively. Six actions or steps arose from these conversations, which include:

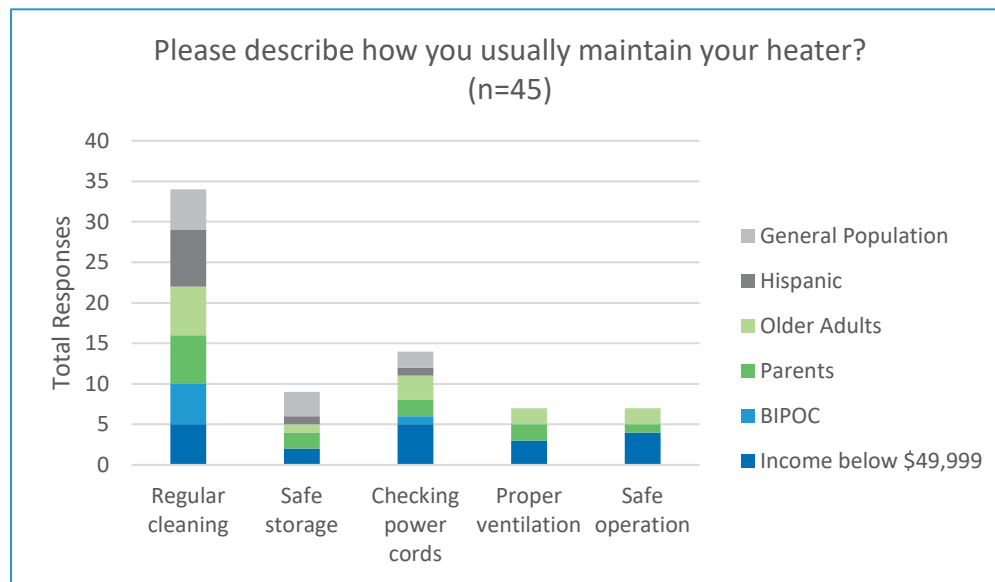
- Regular cleaning
- Safe storage
- Checking power cords
- Proper ventilation
- Checking for safe operation

Participants may have mentioned performing more than one of these actions, however the most frequently mentioned (34 out of 45) was regularly cleaning their heater. This includes dusting or “cleaning the filter regularly.” The second most frequently mentioned action (n=14) was checking the power cords or cables of their heater, such as unplugging it, properly wrapping the power cord, and assuring cables are in good condition (e.g., not melted). One participant [PEH1353], within the Hispanic group, communicated that they perform both of these actions, “Yeah, I was going to say the same thing. Just make sure that it hasn't melted any. I mean, I don't know, not necessarily anything. Just make sure that the cables haven't melted and it's still working. And not necessarily done anything but maybe dust it. I think that's it.”

Yeah, I was going to say the same thing. Just make sure that it hasn't melted any. I mean, I don't know, not necessarily anything. Just make sure that the cables haven't melted and it's still working. And not necessarily done anything but maybe dust it. I think that's it.

(45-54, Hispanic, Parent, Less than \$20,000)

Safe storage (n=9) was the third most frequently mentioned action. Checking proper ventilation (n=7) and safe operation (n=7) were evenly brought up in conversation. It is important to note that these responses represent the number of times an action or step was mentioned within all Knowledge and Practices groups and hybrid sessions, rather than the number of participants. Figure 10 shows the frequency of what actions are performed for general maintenance of heaters.

Figure 10. General maintenance of heaters

Conversely, five participants, across several populations, admitted that they “do nothing” to maintain their heater running efficiently and effectively. Two participants expressed that they replace their heater, with one participant [PEH202] further explaining that they have a warranty in place for an easy exchange.

Safety Considerations of Electric Devices and Heaters

Regarding safety considerations, participants in the Knowledge and Practices groups (n=19) and hybrid sessions (n=26) were first asked how they evaluate the safety of an electric device or product then secondly how they evaluate the safety of the heater. The research team developed the evaluation codes by thoroughly analyzing the discussions related to heaters. They identified recurring themes and topics discussed by the participants and extracted the ten most frequently mentioned evaluation factors. These factors were ordered based on their frequency, from highest to lowest, ensuring accuracy and representation of the conversations. The team engaged in discussions, collaborative decision making, and iterative reviews to maintain accuracy and comprehensibility. The resulting codes provide valuable insights into the considerations and priorities of users when evaluating the safety and quality of heaters. Each of these factors are first defined and then supporting evidence is provided in the discussion about safety concerns related specifically to the heaters.

Compliance with safety standards and regulations: Refers to following instructions to operate heaters properly. Participant agreement with typical safety suggestions and practices, including the importance of following instructions, and the significance of ensuring the product is operated correctly when evaluating the safety.

Electrical safety: The device should have safeguards in place such as grounding, insulation, and protective covers to prevent users coming into contact with electrical components. Responses emphasize the importance of electrical safety when evaluating

devices. Features such as protective casing, intact wiring, and adherence to codes, standards, and safeguards to prevent electrical issues.

Fire safety: Device designed with material resistance to fire and flames, including built-in thermostat shut off to prevent excessive heat and fire hazards.

Proper labeling: Clear and accurate labeling. Participants consider proper labeling with clear and accurate information as an important factor.

Mechanical and structural safety: Refers to the physical aspects and design consideration that contribute to overall safety. Secure and robust construction to prevent damage and accidents, including outside casing and tip-over safety, mechanically sound construction. The durability and strength of the construction materials. The heater should be made using high-quality and resilient materials that can withstand prolonged use and resist damage.

Product testing certification: Participants mentioned the importance of product testing certification and quality assurance marks, such as safety warranties, FTC, BBB, and visiting CPSC website for information and referrals.

Risk assessment and mitigation: Effective mitigation measures should be implemented such as testing safety mechanisms, fail-safe features, or protective systems that eliminate or reduce risk.

User safety considerations: Refers to ergonomic design, rounded corners, non-slip surfaces, which are important to prevent any potential injuries. Ergonomic features that relate to adjustable controls and handles for more convenient operation. Mention of non-slip surfaces as it relates to preventing heaters from accidentally toppling over, especially around children or pets. Importance of rounded corners in reducing the risk of accidental cuts or bruises, preventing potential injuries, particularly in households with children or pets.

Electrical compatibility: Designed to operate within specific voltage range commonly found in households and should have protection against power surges or voltage fluctuations, ensuring their durability and safety.

Quality of components and manufacturing: Refers to the materials, assembly, and manufacturing process. High quality materials, proper assembly, and adherence to quality control standards and overall craftsmanship of product, (e.g., as evidenced by reviews, word of mouth). Reviews and word of mouth refers to the recommendations by individuals who have firsthand experience with a specific heater, mention of products sturdiness and quality.

Although participants were asked these questions separately (first on general electric devices, then specifically on heaters), participants generally focused on just the heaters. ‘**Mechanical and structural safety**’ was frequently cited as an important factor for the safety of both general electric devices and heaters. One participant [PEH237], within the Income below \$49,999 group,

emphasized the importance of mechanical and structural safety for heaters, “Well, I would assume that they all have cages around the heating element. If I was shopping for something, I wouldn't be interested in anything that didn't have a cage that you couldn't reach in and touch the element or the insides of the device.”

Well, I would assume that they all have cages around the heating element. If I was shopping for something, I wouldn't be interested in anything that didn't have a cage that you couldn't reach in and touch the element or the insides of the device.

(24-34, White, Parent, Less than \$20,000)

Hence, the factors of ‘**Fire safety**’ and ‘**Electrical safety**’ following are consistent with safety evaluations for heater products to be protect against these hazards. Another participant [PEH236] responded to both the safety features of the ‘Mechanical and structural safety’ and ‘Fire safety’ as they like the auto shut off feature if the heater tips over, but also shared, “...I do feel more safe with the ones that have the thermostat so where it detects the temperature and it'll shut off if it gets warm enough in there.”

I do feel more safe with the ones that have the thermostat so where it detects the temperature and it'll shut off if it gets warm enough in there.

(24-34, White, Parent, \$70,000 to \$79,999)

The fourth and fifth factors convey very important insights into what consumers seek in features when purchasing heaters. For the fourth factor (**Risk assessment and mitigation**), participants evaluate the safety mechanisms or fail-safe systems in place, such as product stability on surfaces and tip-over safety. As one Income below \$49,999 participant [PEH311] shared, “Well, I would say sort of common-sense matters that the unit should be stable, so it's not likely to tip over, malfunction, that the connection between the cord and the unit itself is solid.”

Well, I would say sort of common-sense matters that the unit should be stable, so it's not likely to tip over, malfunction, that the connection between the cord and the unit itself is solid.

(55-64, White, Non-parent, Less than \$20,000)

The fifth factors, ‘**Compliance with safety standards and regulations**’ and ‘**User safety considerations**,’ although not mentioned in high frequency, participants moderately emphasized safety features and regulations but also personal responsibility. One participant [PEH1431], within the Parent group, perfectly encompassed these two factors by saying, “Well, I'm not too familiar with that. But normally, I just make sure it's an FTC-approved product. And again, I try to keep it away from anything that can obstruct it.”

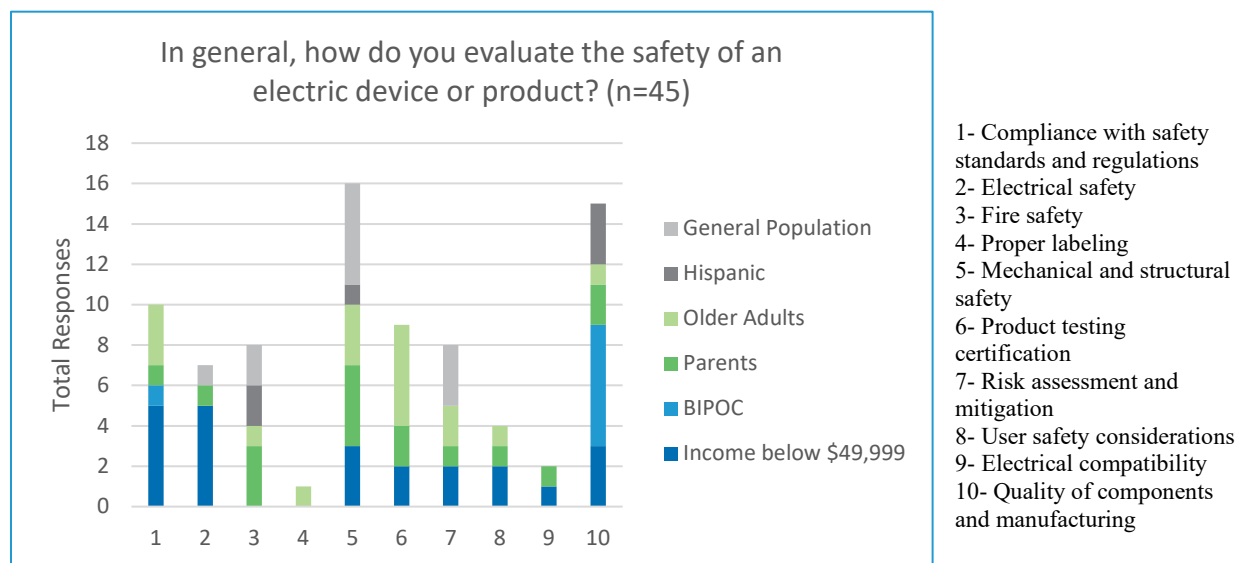
Well, I'm not too familiar with that. But normally, I just make sure it's an FTC-approved product. And again, I try to keep it away from anything that can obstruct it.

(55-64, Hispanic, Parent, \$70,000 to \$79,999)

When initially asked what they evaluated regarding safety of *electric devices or products*, the top six factors that were cited by participants are listed below and shown in Figure 11.

- Mechanical and structural safety (n=16)
- Quality of components and manufacturing (n=15)
- Compliance with safety standards and regulations (n=10)
- Product testing certification (n=9)
- Fire safety (n=8) AND
- Risk assessment and mitigation (n=8)

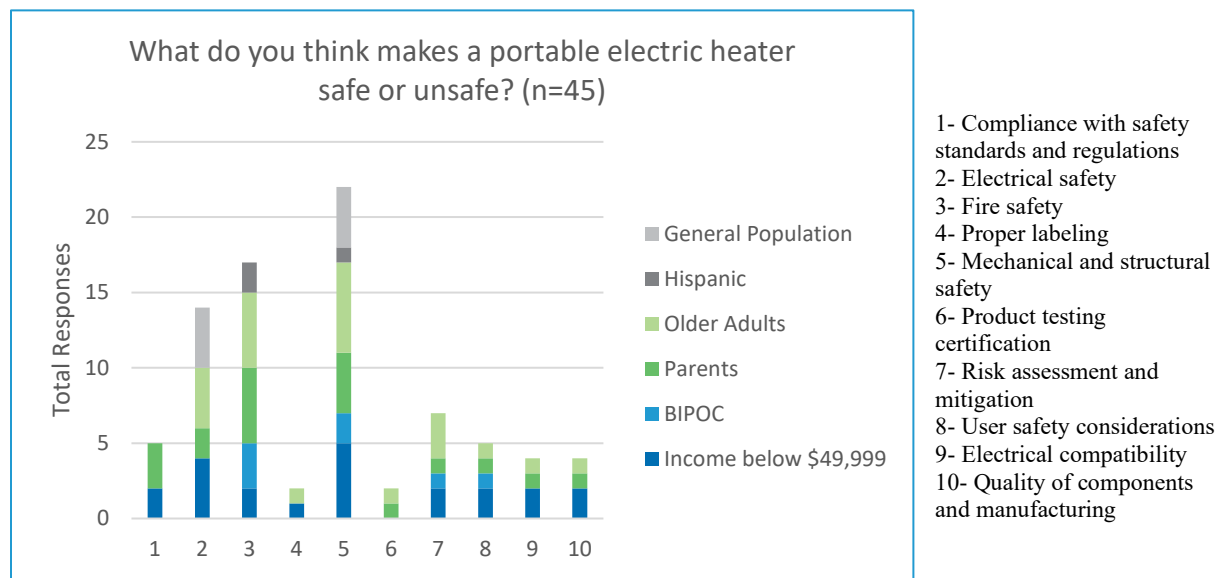
Figure 11. General evaluation of safety of electronic devices or products



Note: Not all participants (n=45) are represented, or a participant may be represented more than once.

Further into the conversation, participants were asked what they evaluated regarding the safety of heaters. Responses in frequency were quite similar to evaluation of general electric devices. The top three factors for heaters that were cited by participants were (Figure 12):

- Mechanical and structural safety (n=22)
- Fire safety (n=17)
- Electrical safety (n=14)
- Risk assessment and mitigation (n=7)
- Compliance with safety standards and regulations (n=5) AND
- User safety considerations (n=5)

Figure 12. General evaluation of safety of heaters

Note: Not all participants (n=45) are represented, or a participant may be represented more than once.

In summary, while participants may consider precautions when assessing the safety of heaters, they still heavily rely on the manufacturer to build products that meet safety standards and regulations. Participants investigate a wide range of factors when considering the safety of their heater, especially as it relates to the fire and electrical safety of a heater to assure that it is sound to use and complies with safety regulations. Participants widely expressed their trust in and reliance on manufacturers to prioritize safety in the products they produce.

Safety Tips or Precautions

The Knowledge and Practices groups (n=19) and hybrid sessions (n=26), a total of 45, were asked if they knew of any general safety tips or precautions when operating heaters. From these conversations, eleven safety tips or precautions emerged and are listed in order of frequency, with the first three being mentioned at a much higher frequency than the remaining eight (See also Figure 14).

1. **Keep clear of obstructions:** This aspect refers to prevention of potential hazards as it relates to obstructions, such as heater not placed near doorways, walkways, or near heavy foot traffic, and including keeping clear of flammable obstructions such as cloth items. This includes keeping heater away from areas where it could be easily knocked over or cause an obstruction.
2. **Avoid leaving unattended:** Includes supervising young children or pets while around portable heaters, and/or unplugging the heater when not in use.
3. **Location:** The location aspect of heater safety refers to choosing the right spot to place heater, such as on stable, flat surface, and/or choosing a location that ensures having proper ventilation. A stable surface allows for proper positioning and ensuring that it functions effectively. Keeping clearance space around the heater to ensure airflow and prevent overheating, such as avoiding a cramped corner.

Plug directly into an outlet: avoid using extension cords or power strips so not to overload.

4. **Clean and maintain heater:** Regularly dust and remove debris.
5. **Avoid wet areas:** Do not use heaters in wet areas. Avoid touching with wet hands.
6. **Inspect:** regularly inspect the cord and plug for any damage.
7. **Thermostat or timer:** These features can help regulate the temperature and automatically shut the heater off.
8. **Instructions:** Read and follow the manufacturer's instructions.
9. **Appropriate size of heaters:** Use heaters appropriate for intended size of room. Undersized heaters may not provide enough warmth and may cause heaters to overwork or overheat.
10. **Tip-over safety:** Use heaters with a tip-over safety switch.

The first three safety tips on the list were referenced at a higher frequency by the participants. Keeping the heater **clear of obstructions** as a safety tip was the highest frequently mentioned (n=22) amongst the participants. One participant [PEH428], within the Income below \$49,999 group, simply explained, “Make sure it's not around nothing, like clothes or nothing like that.”

The second most frequently mentioned safety tip was ‘**avoid leaving the heater unattended**’ (n=18) followed by ‘**location**’ as the third most referenced safety tip (n=11). Another participant [PEH016], also within the Income below \$49,999 group, differentiated **keeping clear of obstructions** from **location** by adding the point that it should be on a flat surface, “Just make sure the wire's not around it, and make sure the surface that the heaters on are flat. And the heaters don't want a lot of flammable [objects] around it, like cloth, or paper, or anything that can potentially catch heat.”

Just make sure the wire's not around it, and make sure the surface that the heaters on are flat. And the heaters don't want a lot of flammable [objects] around it, like cloth, or paper, or anything that can potentially catch heat.

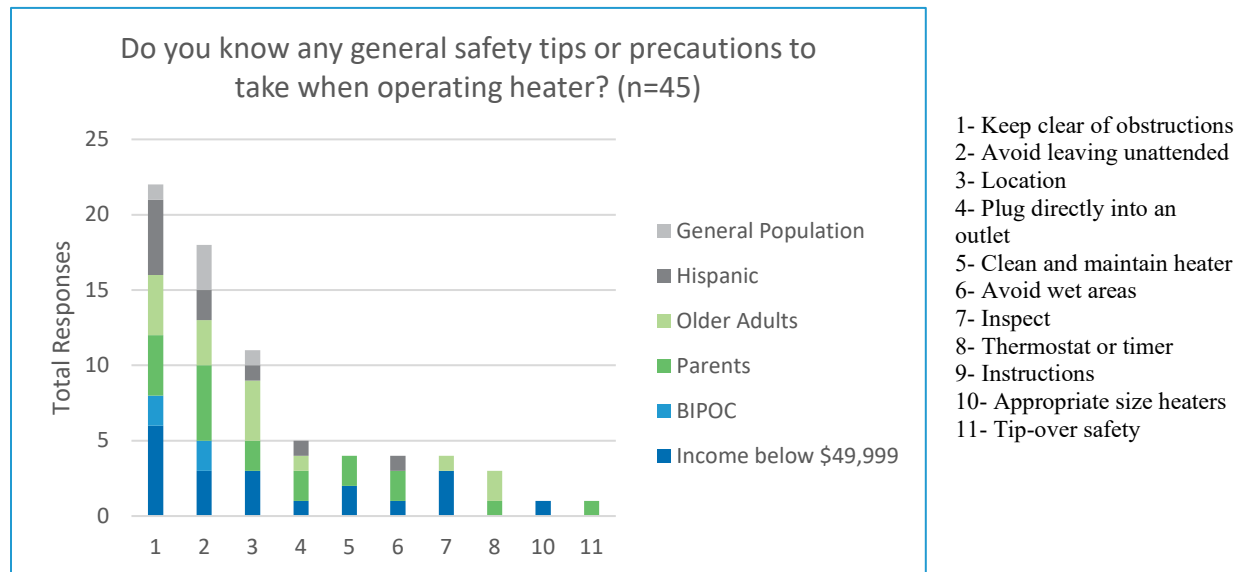
(24-34, Asian, Non-Parent, Less than \$20,000)

In addition, three participants had different safety tips (or behaviors) when it came to heaters. One Hispanic participant [PEH1387] mentioned that they look at the wattage and look of a heater, “I think for me it was kind of maybe the look of it and also I think it was the watts, how powerful it was.” Two participants, both within the General Population group, shared that they prefer to plug in their heater to a power strip as it is “more efficient than straight into the walls sometimes.” One participant [PEH391] further shared this moderate risk behavior due to past experience, “I've had the old one break or throw the breaker a couple times. I'm kind of a little skittish, I guess.”

See Figure 13 for frequencies reported on knowledge of safety tips from the list above. It is important to note that these responses represent the number of times a safety tip was mentioned

within all Knowledge and Practices groups and hybrid sessions, rather than the number of participants.

Figure 13. Knowledge on safety tips and precautions



Overall, most participants are knowledgeable on various safety tips and precautions when it comes to their heater, especially in terms of fire safety, such as keeping clear of flammable objects; not leaving heater unattended; and being deliberate about where they place their heater.

Experiences with Heaters

In connection with past experiences, participants within the hybrid sessions (n=26) were explicitly asked if they experienced any kinds of safety hazards/issues/events when using their heater. Fewer than half of the participants (n=10) reported that they have not experienced any hazardous events with their heater, whereas more than half of the participants (n=15) reported that they have experienced a safety hazard/issue/event with their heater. One participant did not comment on their past experiences. Figure 14 shows the reports from the participants on whether they had a negative experience or not.

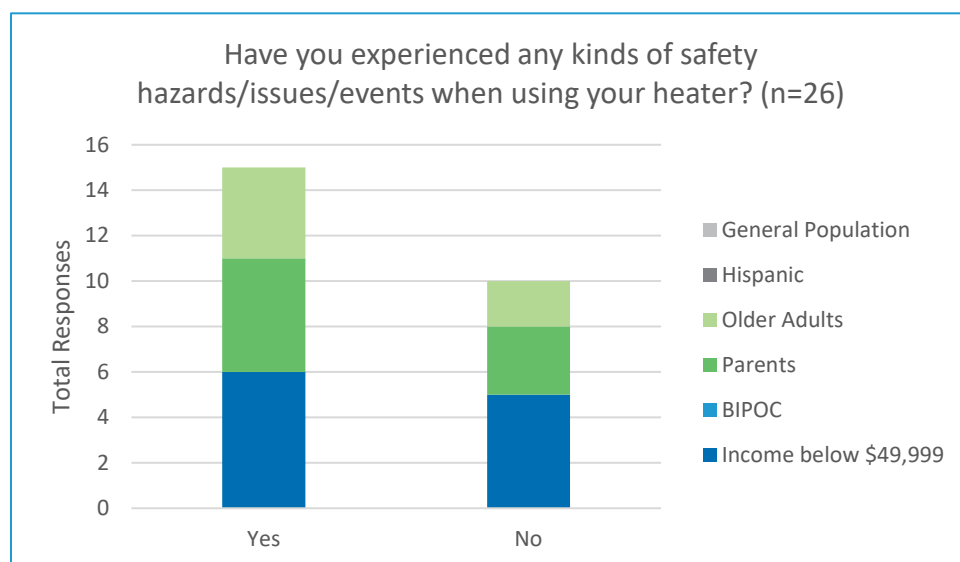
Figure 14. Negative experiences with heaters

Table 8 presents a summary of responses of the issues that were discussed during the focus group sessions. The table describes the issues participants experienced with their heater and provides details on whether each issue was successfully resolved or addressed.

Table 8. Issues with heater and resolution

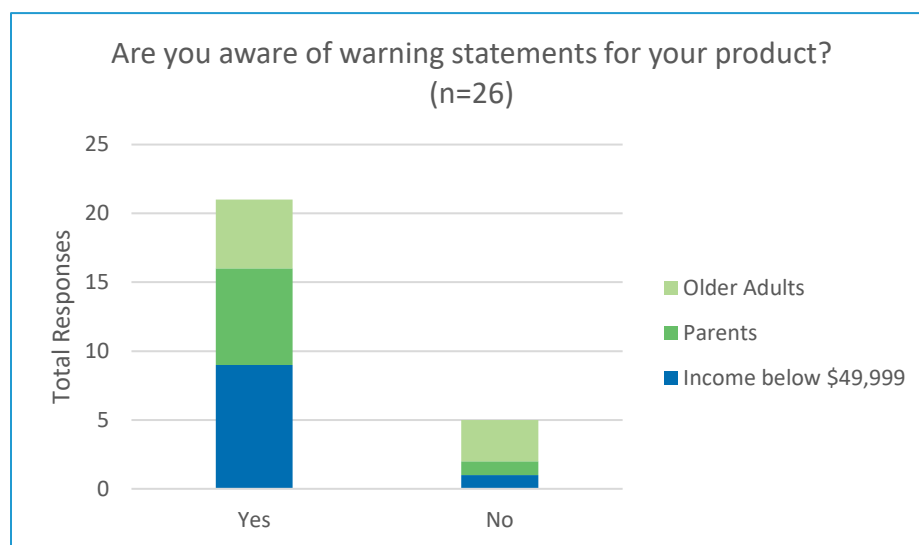
Issue	Result or Resolution
Malfunctions, such as heater stopped working, smells coming from the heater, overheating, or that the heater looked used (5 responses)	Returned or exchanged the heater
Heater falling or tipping over (3 responses)	Pick up the heater
Cord or outlet problems, including the extension cord melting (3 responses)	Using fire extinguisher, replacing the outlet or heater, or using the central heating system
Leaving it turned on unattended for more than a day (1 response)	Electric bill being high
Children putting things on the heater accidentally (1 response)	Caused a smell, but no extreme danger
Safety grate coming off due to placement under the desk and accidentally being kicked (1 response)	Put back the safety grate, considering buying a new one
Power outage or tripping due to energy being used from the heater (1 response)	No resolution mentioned

In summary, for the participants that did have a negative experience most were benign and could be easily resolved. This includes replacing the heater if it stopped working, picking up the heater if it tipped over, or taking off the obstruction on top or in front of the heater.

Awareness of Warning Statements on Heaters

Participants within the hybrid sessions (n=26) were asked about their awareness of warning statements on their heaters, the helpfulness of these warning statements, and whether they understood the statement associated with their heater. Most of the participants (n=21) reported being aware of a warning statement on their heater. Participants mentioned that these warning statements were on the cord of the heater or on the heater, or within the brochure or instruction manual. One participant [PEH1063], within the Parent group, shared, “I mean, I know there were some stickers on it at one point that said stuff like that, but I never read them.” Five participants were not aware of any warning statements on their heater. One participant did not comment on their overall awareness of a warning statement. Figure 15 shows the reports on awareness of warning statements.

Figure 15. Awareness of heater warning statements



Participants were then asked further to rank the helpfulness of these warning statements. Participants had the option to choose from four response categories: “Very Helpful,” “Somewhat Helpful,” “Not Very Helpful,” and “Didn’t Read Them.” Among participants that responded, ten reported it was “very helpful.” Eleven participants reported that the warning statements were “somewhat helpful.” One participant [PEH324], within the Income below \$49,999 group, ranked it “somewhat helpful” as it did not add more to their knowledge of safety, “For me, with my knowledge base, they’re not adding anything to my system that isn’t already there. I’m sure that there are people who don’t work with electricity who might well gain from those.”

For me, with my knowledge base, they’re not adding anything to my system that isn’t already there. I’m sure that there are people who don’t work with electricity who might well gain from those.

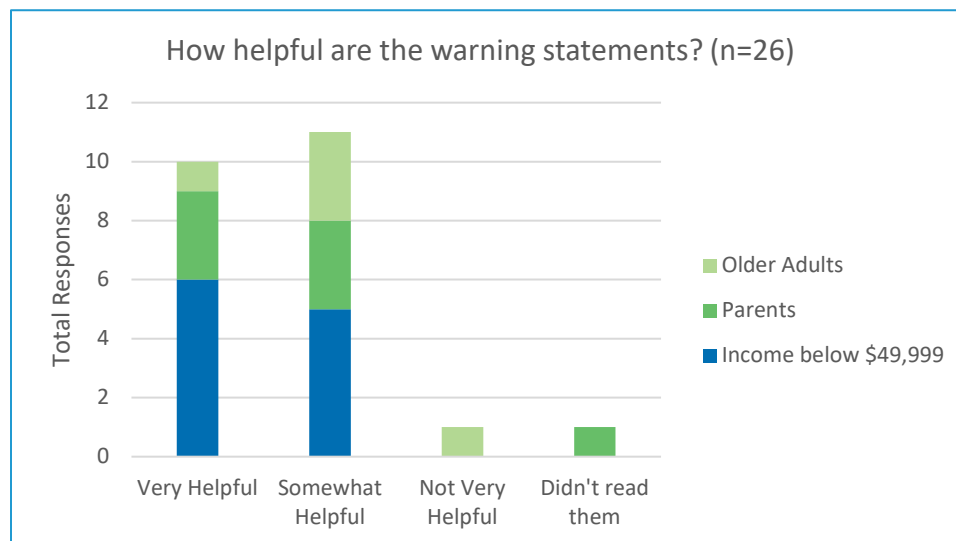
(75 or older, White, Non-Parent, \$40,000 to \$49,999)

One participant [PEH218], within the Older Adults group, reported that they did not find the warning statement helpful, due to years of experience, “To me they weren't helpful because I've had these stuff for a long time. I'm familiar with electrical appliances and I know what to watch out for or what not to do and what to do.” One participant did not read the warning statement. Three participants did not comment on the helpfulness of the warning statement. Figure 16 shows the responses to the rankings.

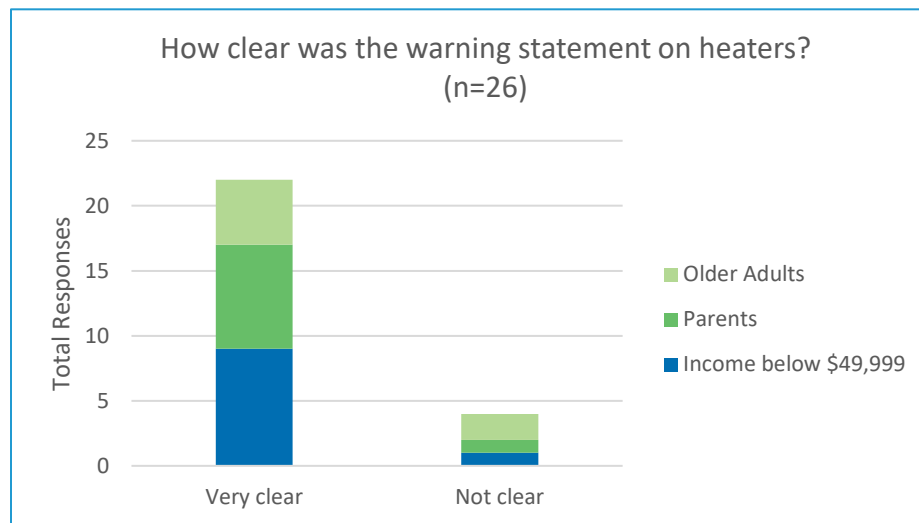
To me they weren't helpful because I've had these stuff for a long time. I'm familiar with electrical appliances and I know what to watch out for or what not to do and what to do.

(75 or older, White, Non-Parent, \$100,000 or more)

Figure 16. Ranking of helpfulness of warning statements



Participants were also asked about their overall understanding of the warning statements in association with their heater, and to provide an example of clear and unclear statements. One participant, within the Income below \$49,999 group, instantly admitted that they just glanced at the warning statement with no indication of clearness. Twenty-two participants reported instances when their warning statements were “very clear.” Whereas there were four participants that reported that the warning statements were “not clear.” It is important to note that these responses represent the number of times a participant responded within all hybrid sessions, rather than the number of participants. See Figure 17 for responses to clearness of warning statements.

Figure 17. Clearness of warning statement on heaters

One participant [PEH1431], within the Parent group, who commented on understanding the warning statements, shared a suggestion, “I just wish that they make it clearer, especially when it comes to portable electric heaters, that they do need to put that they have to clean out those elements before you turn them on. Because a lot of people just store them after, let's say, the winter. And they forget there's lint, and dirt, and other things that can accumulate in those elements that can catch on fire.” Another participant [PEH346], within the Older Adults group, desires more clarity on icons followed by the associated words, “I think at times that icons are meant to be international and I would rather see words or an icon and a word. Wavy lines, is that meant to be heat? Is that meant to be air movement? So, my English comprehension is decent, so I'm not concerned about anything I read, but I think iconography can only be made better with words along with it.”

I think at times that icons are meant to be international and I would rather see words or an icon and a word. Wavy lines, is that meant to be heat? Is that meant to be air movement? So, my English comprehension is decent, so I'm not concerned about anything I read, but I think iconography can only be made better with words along with it.

(55-64, White, Non-Parent, \$100,000 or more)

Delving deeper into examples that were clear or unclear, participants communicated about warning statements that they found unclear or confusing. Other participants also cited confusion or uncertainty about the icons used in the warning statements. In addition to the uncertainty of what the wavy lines means, one participant described confusion about a battery icon, and another indicated uncertainty with temperature regulation. Four participants also shared confusion or uncertainty due to language barriers, such as the heater coming from another country and the translation not being comprehensible [PEH346, White, Age 55-64, \$100k+ income] suggesting that the iconography can be made better when combined with the associated words/terms. Additionally, one participant mentioned the instructions being too technical [PEH385, Asian,

Age 55-64, \$100k+ income]. One participant stated having confusion or uncertainty surrounding specifications for room size [PEH366, Black, Age 65-74, \$40-\$49k income]. Another participant mentioned that the print is not bold enough when it comes to the proper wattage usage [PEH218, White Age 75+, \$100k+ income]. One participant [PEH236], within the Parent group, further explained the importance of a warning statement on the potential of the heater overheating, “I think it would be helpful to know more about the potential for the unit to overheat and the consequences from that versus just mainly the fire risk of having items too close to the heater or sleeping with the space heater on or those kinds of things.”

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(24-34, White, Parent, \$70,000 to \$79,999)

One participant, within the Income below \$49,999 group, shared their confusion with their heater warning about overheating or leaving it unattended when their heater has an auto-shutoff feature.

In general, most participants are aware of warning statements on their heater(s). Those that are aware of warning statements responded that the messages were “very helpful” and “somewhat helpful.” A few participants offered suggestions of clear labelling that the heater requires general maintenance. Another suggestion is that the icons used need to be understandable, perhaps followed by words for clearer translation and communication of the icon representation. Overall, participants cited that the warning labels are “very clear.” However, for times that it was unclear this related to lack of knowledge of what icons meant and contradictory messaging (e.g., don’t leave unattended but heater has auto-shutoff feature).

Actions Taken with Unclear Warning Statements

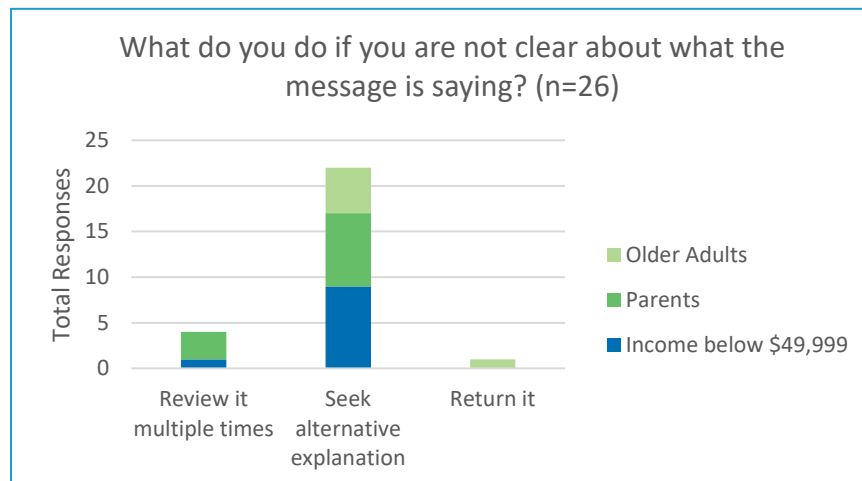
Participants within the hybrid sessions (n=26) were asked what they do when a warning statement is not clear, and to share warning statements that were a surprise to them. Most of the participants (n=22) reported that they would seek an alternative explanation to clarify a warning statement. This includes asking someone (e.g., mother or sibling), seeking information online or contacting the heater customer service either via email or phone call. As one BIPOC participant [PEH202], explained, “I usually will do my own research or talk to somebody who's more knowledgeable than me on something like that. But usually I can [redact] it and someone else who's way more terrified of it has asked that question, whether it be on [redact], [redact] answers or what have you out there, and it's like, oh, okay, well then this isn't as big of a deal, but if it is, at least now I know what to do.”

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(24-34, White, Non-Parent, \$40,000 to \$49,999)

Very few (n=4) noted that they would review it multiple times to try to understand it. One participant, within the Older Adults group, noted that they would return the heater. See Figure 17 for responses to actions participants would take to clarify a warning statement. It is important to note that these responses represent the number of times a participant responded within all hybrid sessions, rather than the number of participants.

Figure 18. Unclear of heater message



Although not mentioned by others, the fact that participant [PEH398] would return the heater, may indicate it may be common for other consumers within the older population. They explain, “I might return it if it's got a complicated thing that I don't understand. Mainly, I just want something for convenience, but if it gets elaborate and complex, I might just return it for another product like it.” The responses show that warning statements need to be comprehensive, not just for older populations, but for the general population.

I might return it if it's got a complicated thing that I don't understand. Mainly, I just want something for convenience, but if it gets elaborate and complex, I might just return it for another product like it.

(65-74, White, Non-Parent, \$80,000 to \$89,999)

Furthermore, participants were asked if any of the warning statements or general instructions surprised them about their heater. Of the participants that were able to respond (n=19), 12 indicated that they were not surprised by any messages or that the messages they saw were considered “common sense.” One Parent participant [PEH1431] explained that the warnings serve as a reminder, “I’m glad it reminds me that any electrical wire, electricity is going through there, so there’s a chance that fire can erupt. So, it may be surprising in a sense, but not surprising at all. Because like I say, it is electricity going through there.”

It is important to note that one participant [PEH218], within the Older Adults group, admitted to finding no surprises but indicated that new advances in the technology can be cumbersome to learn, “The caution message was nothing surprising from what I read. Like I said, I didn’t read them all. And these things tend to get more complex as time goes on from what used to be on and off or high fan, low fan, and just a fan. Now this one has 1, 2, 3, 7 buttons in the front. One is on, off, I truthfully don’t know what all seven buttons are for. It has a remote control and I use that, and so it’s good enough for my limited purposes. It probably could do a whole lot more than I use it for or I need it for.”

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(75 or older, White, Non-Parent, \$100,000 or more)

Seven participants did voice some surprise at the messages they have seen. These warning statements came as a surprise to folks as they thought it would be “common sense.” This includes keeping the heater a safe distance from flammable objects, not touching the product when it is on (hot to touch), and the wattage of the heater. Regarding wattage, one participant [PEH202], within the Income below \$49,999 group, stated, “...I guess in my mind, just seeing the wattage now, I assume most products, especially like I said, if you see energy saver or eco-friendly, usually they’re not going to take a lot of power, but when they do list it’s like, hey, if you are going to plug it in with something, make sure it’s this [wattage] or this [wattage].” Two other warning statements fumbled two participants due to their usage with a heater. The first was not using an extension cord (e.g., heater cord is not long enough) and how long a heater should be operated (e.g., cannot be operated more than three hours).

In summary, participants seek an alternative explanation, such as online tutorials, friends, and family, when they need clarification on warning statements. Participants seek an easy route to reach a solution, as very few mentioned reviewing or reading the unclear message multiple times. Most participants’ reaction or response to being asked about if they were surprised by any warning messages is that it should be “common sense,” such as keeping your heater a safe

distance from flammable objects, not touching the product when it is on (hot to touch), and the wattage of the heater.

Use and Behaviors

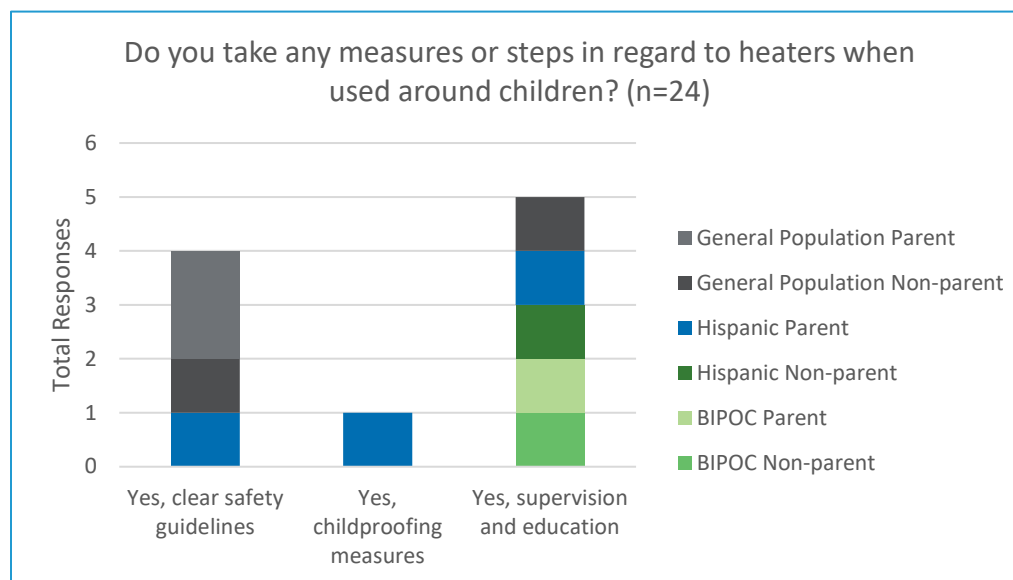
Participants were asked a series of questions to gain further insights into their patterns of usage and associated behaviors. This includes safety measures with children (and others), placement of heaters, and assessing risks and behaviors with certain actions or when challenges arise.

Measures for Child Safety

Participants with the Decision Making groups (n=24) were asked whether they take any measures or steps to safeguard their children around heaters. Even a few participants that are not parents responded to this question. Among participants that did respond (n=8) across these groups, a majority shared that they do take measures or safeguards. Two participants responded they do not take any safety precautions. One participant, within the General Population group, does not have children but when they do have children in the house, they do not permit children around the heater. The other participant [PEH1557], within the BIPOC group, indicated their youngest is 15 years old and knows safety around heaters. They share that they have a pet, but it is “pretty aware that he can't touch it, because if he touches it and tips it over, it'll shut off. He won't be happy because he'll get cold.”

Those that do take safety measures communicated that they share clear safety guidelines, take childproofing measures, and/or supervise and educate children or guests. It is important to note that these responses represent the number of times a safety measure was mentioned within all Decision Making groups, rather than the number of participants. Figure 19 demonstrates the results across the traditional sessions (General Population, Hispanic, and BIPOC) of what measures or steps are taken by participants to ensure the safety of children and other individuals.

Figure 19. Measures or steps for safety guarding around heaters



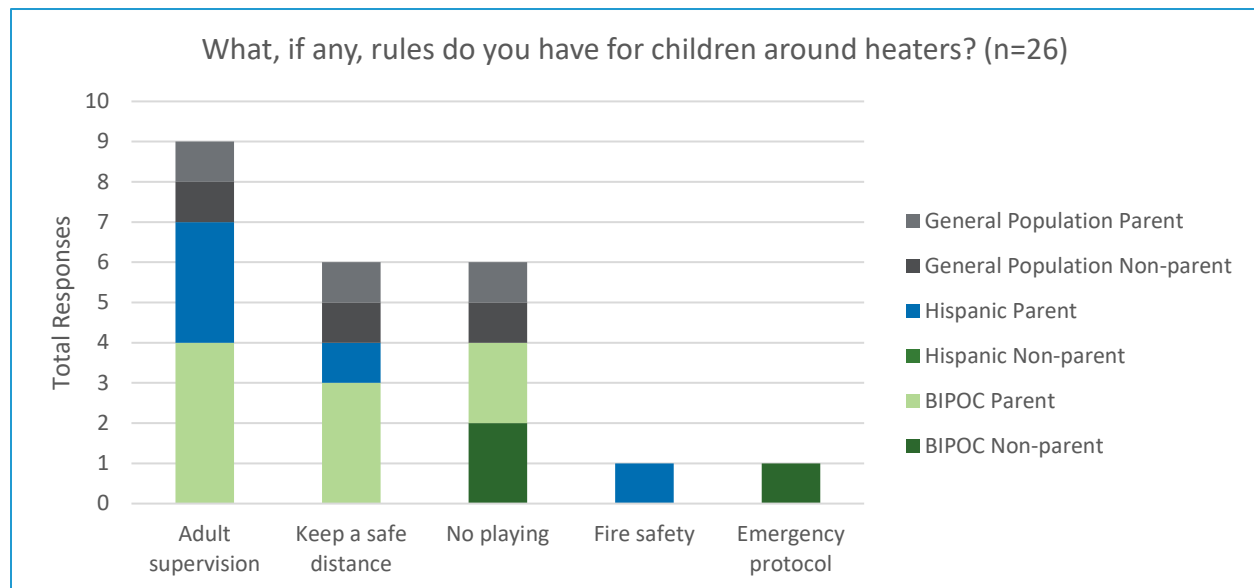
Rules with Children and Others

Participants within the Knowledge and Practices groups (n=19) and Decision Making groups (n=24) were explicitly asked about rules they have with children around heaters. Even participants that are not parents spoke about rules surrounding guests or pets. From these conversations, four consistent rules arose:

- **Adult supervision:** Only adults operate heaters or heaters are used under adult supervision.
- **Keep a safe distance:** Children should keep a safe distance away from the heater.
- **No playing:** Children are not allowed to play near the heater.
- **Fire safety:** Dangers of placing paper, clothing, or blankets close to heaters.
- **Emergency protocol:** How to respond to any accidents like burns.

Among participants that did respond (n=26), adult supervision was most often mentioned (9 out of 26) as the number one rule for usage of heaters with children or others, such as guests. This is followed by keeping a safe distance (6 out of 26), not playing near the heater (6 out of 26), then general fire safety and emergency protocol (1 out of 26). It is important to note that these responses represent the number of times rules were shared within all Knowledge and Practices groups, rather than the number of participants. Figure 20 demonstrates the responses across the traditional sessions (General Population, Hispanic, and BIPOC) about rules around children and others.

Figure 20. Rules around children and others



One participant [PEH1072] within the General Population group admitted to teaching their children about the dangers of heaters using the “one-finger rule.” They shared, “They want to grab it, ‘Just one finger. That way you only have a spike in one finger,’ and then they learn, and they can't really get hurt because it's just one finger... So, my kids have all touched the heaters.”

They want to grab it, 'Just one finger. That way you only have a spike in one finger,' and then they learn, and they can't really get hurt because it's just one finger... So, my kids have all touched the heaters.

(35-44, White, Parent, \$70,000 to \$79,999)

Placement of Heaters

Participants across all groups and populations (n=69) were asked about the placement (e.g., room or area) of their heaters and why they chose to place them in these locations. When asked directly where or in what rooms they use their heater, one participant [PEH1047], within the General Population group, bluntly stated, “Yeah, I put them in all the rooms.” This statement aligns with participants having multiple heaters in several rooms or moving their heater from one place to another. As another participant [PEH1072] in the General Population group shared, “We typically have ours in the bedrooms. If I'm cooking, I might turn it on in the kitchen if I'm not using the oven or something, but for the most part, they're just in the rooms with the kids or with myself.” A participant [PEH385] within the Older Adults group explained, “I use it in the place that I work because my desk right now is in the master bedroom, so I put my, yeah. But yeah, other member- my husband, he is outside, so he put there too.” Participants commonly referred to these rooms or locations in their responses:

- Bedroom (n=31)
- Living room (n=23)
- Home office or study (n=17)
- Cold spots or drafty areas, which includes:
 - Bathroom (n=8)
 - Kitchen (n=5)
 - Patio or Sunroom (n=4)
 - Basement (n=3)
- Dining room or den (n=2)
- Garage (n=2)
- Nursery or child's room (n=4)

We typically have ours in the bedrooms. If I'm cooking, I might turn it on in the kitchen if I'm not using the oven or something, but for the most part, they're just in the rooms with the kids or with myself.

(35-44, White, Parent, \$70,000 to \$79,999)

This topic was investigated further with the Knowledge and Practices groups (n=19) and hybrid sessions (n=26) when they were asked what they considered in terms of their decision for placing

their heaters in selected room(s) or area(s). Six themes, with sub-themes, arose from these conversations, such as:

- 1- Ease of access, which further explores into:
 - 2- Efficiency of coverage
 - 3- Level of activity
- 4- Proper clearance
- 5- Ventilation
- 6- Outlet accessibility
- 7- Stable surface
- 8- Child and pet Safety

Most of the participants (38 out of 45) communicated that ease of access was their main reason for deciding where to put their heaters. This includes the room or area that is used the most or needs the most heat, efficiency of coverage, and the level of activity. One participant [PEH1063], within the Parent group and who has two heaters, explained that one is under their desk and that the other is in the bathroom. They shared, “We decided it because we remodeled an old, enclosed porch into a bathroom wash area and there's something wrong with the heater and we just haven't got it fixed yet. So, we decided to put one in there in the meantime...”

We decided it because we remodeled an old, enclosed porch into a bathroom wash area and there's something wrong with the heater and we just haven't got it fixed yet. So, we decided to put one in there in the meantime...

(25-34, Two or more races, Parent, \$70,000 to \$79,999)

Although the remaining five considerations were mentioned less frequently (fewer than five times each), participants provided explanations for these decisions. Considerations ‘4- Proper clearance’ and ‘5- Ventilation’ were both mentioned a total of four times. A Parent participant [PEH426] detailed their decision for proper clearance and noted a safety decision (8- Child and pet Safety), “Range, so it has to be close enough that I can actually feel it. Someplace the dogs won't run into it or tip it over. And yeah, it has to be close enough that I can feel it and not in a traffic pattern.”

Range, so it has to be close enough that I can actually feel it. Someplace the dogs won't run into it or tip it over. And yeah, it has to be close enough that I can feel it and not in a traffic pattern.

(45-54, White, Parent, \$40,000 to \$49,999)

Consideration ‘6- Outlet accessibility’ (n=3) was brought in conversation during the Hispanic group. As one participant [PEH1339] stated, “I keep it in the bedroom. My apartment's a little bit

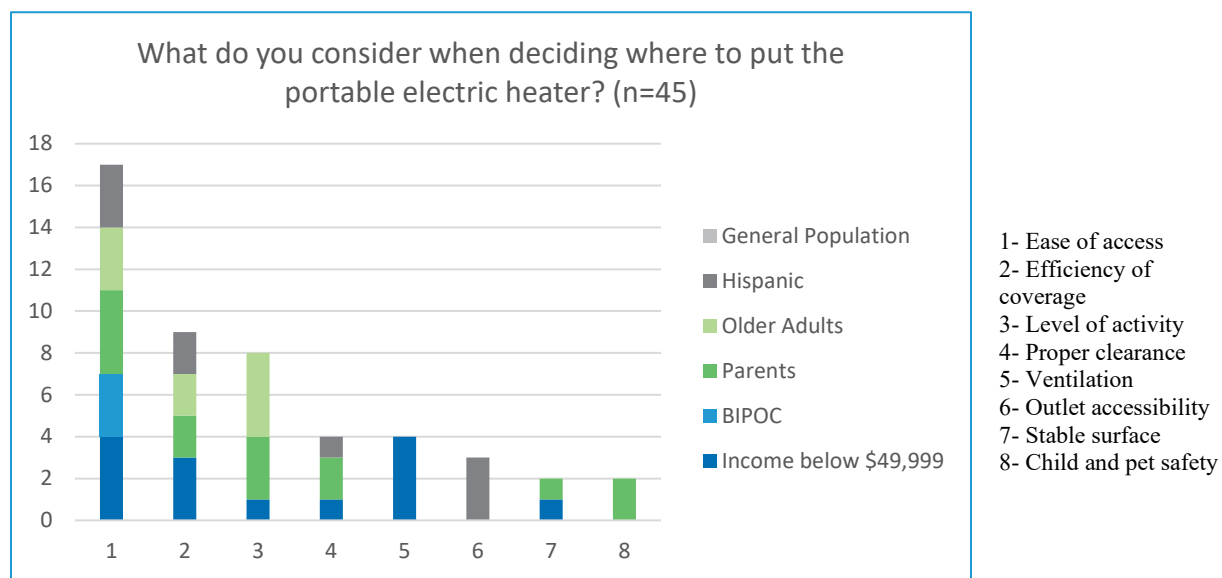
weird in that there's only one outlet that isn't connected to anything else, so it has to be connected to that. It's plugged in in the living room but running in the bedroom, if that makes sense.”

I keep it in the bedroom. My apartment's a little bit weird in that there's only one outlet that isn't connected to anything else, so it has to be connected to that. It's plugged in in the living room but running in the bedroom, if that makes sense.

(25-34, Hispanic, Non-Parent, \$40,000 to \$49,999)

It is important to note that responses represent the number of times considerations listed above were mentioned within all Knowledge and Practice and Hybrid sessions, rather than the number of participants. Figure 21 displays all responses to the actions listed above.

Figure 21. Considerations for heater placement



Participants within the hybrid sessions (n=24) were also queried about why the heater was not placed in other areas. They shared that it would be less cost effective as heating is not needed in other areas, or simply that no one uses the other areas in high frequency.

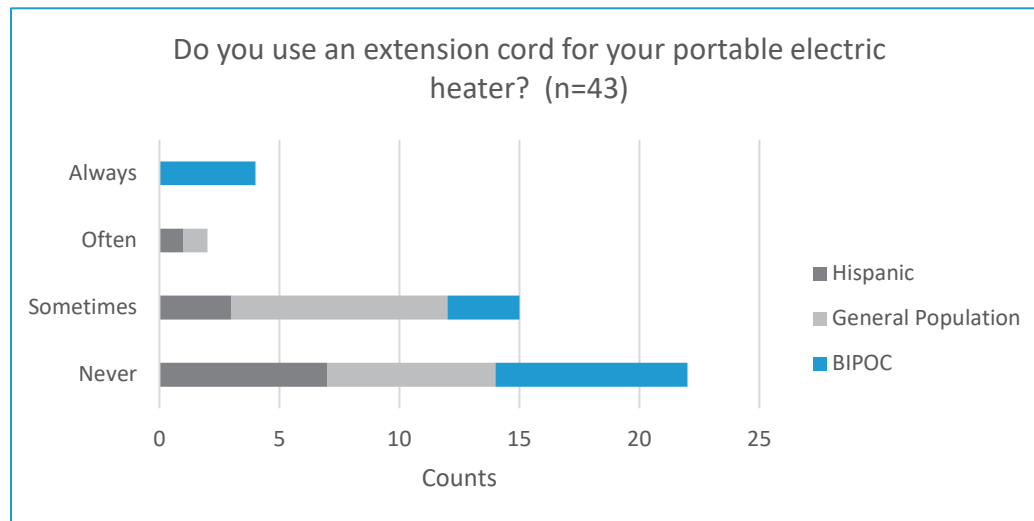
Typically, participants reported that the main room or area in which they use their heater is their bedroom. This is followed by living room, home office or study, and cold or drafty areas. The latter includes patios, bathroom, and kitchen. The usage of these areas is due to ease of access, including areas of high activity, proper clearance, and ventilation.

Assessing Risks – Polling Questions

Participants from all traditional sessions (Knowledge and Practices groups (n=19) and Decision Making groups (n=24)) were surveyed with two polling questions to gauge their understanding and perceptions of risks involved in using heaters. The Knowledge and Practices groups (n=19) were explicitly polled on usage of a power strip for their heater and the frequency of such usage.

The first poll question asked participants from all traditional sessions (Knowledge and Practices groups (n=19) and Decision Making groups (n=24)) on the usage of an extension cord for their heaters and the frequency of such usage. Participants had the option to choose from four response categories: “Always,” “Often,” “Sometimes,” and “Never.” Figure 22 displays the results from this poll.

Figure 22. Frequency of extension cord usage



Just over half of the participants (22 out of 43) reported “Never” using an extension cord with their heaters. Conversely, almost half of the participants (n=21) reported “Sometimes” to “Always” using an extension cord. This highlights an unsafe practice which puts these populations at risk of electrical or fire hazard and for which participants have not taken precautions. Moreover, it is worrisome that four participants within the BIPOC populations selected “Always.” A few participants (n=5) were able to provide two reasons for this unsafe practice. The first reason is limited outlet availability. One participant [PEH118], within the BIPOC group, rationalized, “I put sometimes, just because if I’m trying to have it be in an area where the cord might be too short, so I use an extension cord so it would reach wherever I’m trying to heat.” Another participant [PEH096], within the General Population group, explained, “We’re in an older house that doesn’t have a lot of outlets, so a lot of times we just need a longer extension cord to get it to the place we want it.” The second reason one participant [PEH187], within the General Population group, explained is flexibility of placement. They shared, “I’ve noticed in the cheaper models, the cord is quite short, so you do have to use the extension cord.”

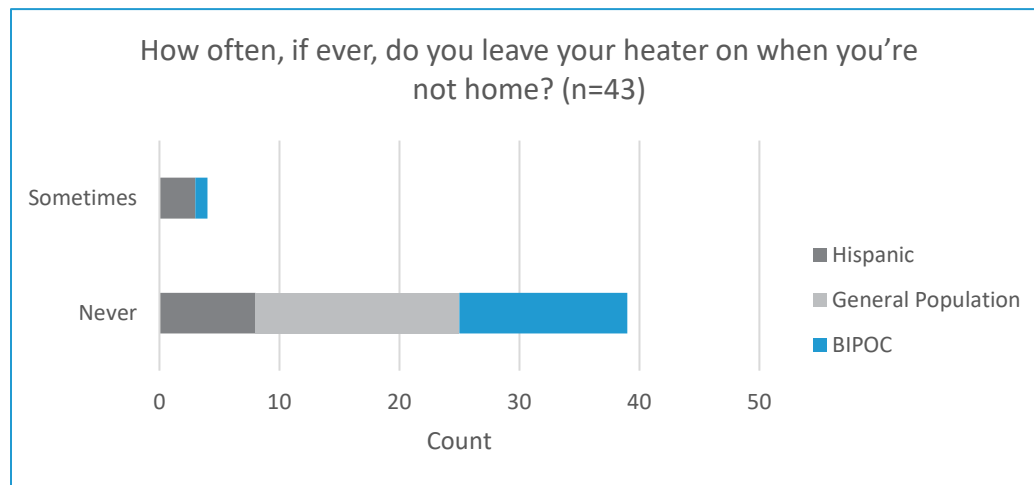
We're in an older house that doesn't have a lot of outlets, so a lot of times we just need a longer extension cord to get it to the place we want it.

(34-44, White, Parent, \$100,000 or more)

The second poll asked if they ever leave the heater on when they are not home. Participants had the option to choose from four response categories: “Always,” “Often,” “Sometimes,” and

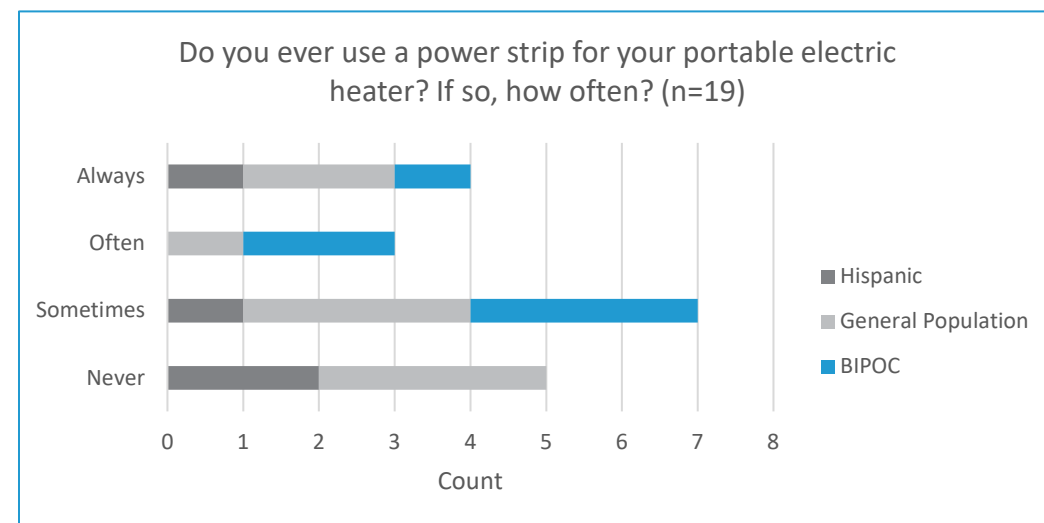
“Never.” A majority of the participants (39 out of 43) reported “Never” leaving their heater on when they leave their house. Very few participants (4 out of 43) participants reported “Sometimes” leaving their heater on when they leave the house. These counts include three (3) participants within the Hispanic group and one (1) within the BIPOC group. This shows that a majority of participants are aware of this electrical and fire hazard. Figure 23 displays the results from this poll.

Figure 23. Leaving heater on when not home



All Knowledge and Practices groups (n=19) were explicitly asked about usage of a power strip for their heater and the frequency of such usage. Participants had the option to choose from four response categories: “Always,” “Often,” “Sometimes,” and “Never.” In resemblance with responses to usage and frequency of extension cord usage, about three-quarters (14 out of 19) reported to “Sometimes” to “Always” using power strips. The remaining five participants (four within the Hispanic group and one within the General Population group) reported “Never” to using a power strip with their heater. Figure 24 displays the results from this poll.

Figure 24. Usage of power strips with heaters



In summary, these three polling questions provide insight to moderate risk behaviors across Hispanic, General Population, and BIPOC populations who reported using an extension cord or power strip “sometimes” to “always.” These moderate risks occur due to limited outlet availability and flexibility of placement. However, participants generally have a positive practice of “never” leaving the heater on when they are not home.

Malfunctions and Challenges with Heaters

Participants from all traditional sessions (Knowledge and Practices groups (n=19) and Decision Making groups (n=24)), were questioned on what they do if their heater stops functioning. Two main actions (or inaction) arose from these conversations: 1) work directly to investigate the cause of the heater not functioning or 2) bypass the frustration. Of participants that were able to respond, 19 participants answered that they would work directly with the heater, this includes:

1. Checking the power source
2. Resetting the heater
3. Cleaning or replacing the filter
4. Inspecting and/or contacting manufacturer or professional
5. Reviewing the user manual or other sources, such as online

However, there was a higher frequency of participants (n=25) reporting that they would bypass the frustration by:

6. Replacing the heater
7. Finding an alternative heating source, like a blanket

Replacing the heater was by far the highest reported (n=24) action out of all the others, with several participants instantly responding with this answer. However, participants did share factors they consider before replacing or returning the heater. Factors were based on whether they directly tried to fix the issue or the age of the heater (e.g., recently purchased new versus an old one). As one participant [PEH1341], within the Hispanic group, shared, “Yeah. If it's not working, I'm not going to go through all that trouble. I mean, if I purchased it recently, of course I'll return it to the store. But if I've had it for a while, I'll just get another one, and throw it out. I don't want to take any chances on it.”

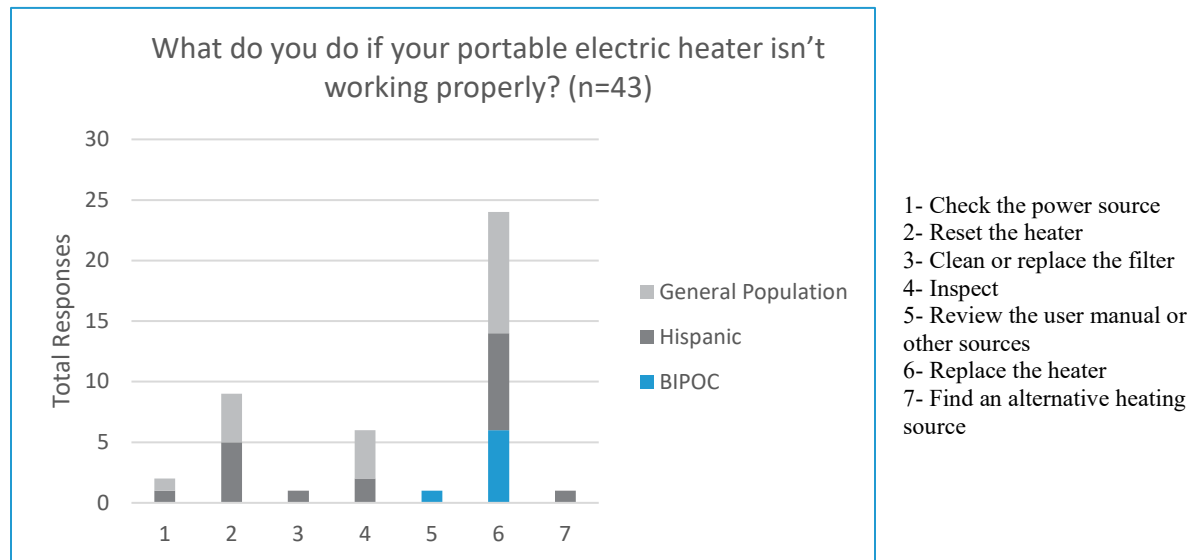
Yeah. If it's not working, I'm not going to go through all that trouble. I mean, if I purchased it recently, of course I'll return it to the store. But if I've had it for a while, I'll just get another one, and throw it out. I don't want to take any chances on it.

(55-64, Hispanic, Parent, \$100,000 or more)

Another participant [PEH222], within the General Population group, simply noted, “I guess it depends on the problem, if it's something that seems major like it's just getting way too hot or it's just not working at all, I might look a little bit into it, but I'll probably just get in a different one.” It is important to note that responses represent the number of times actions were mentioned

within all traditional sessions, rather than the number of participants. Figure 25 displays all responses to the actions listed above.

Figure 25. Actions taken on malfunctioning heaters



Participants from all traditional sessions [Knowledge and Practices groups (n=19) and Decision Making groups (n=24)], were also asked about any challenges they face when operating their heater. Of participants that responded, the most frequent response (n=9) is their heater has limited heating capacity, or it heats their area unevenly. For example, one participant [PEH062], within the General Population group, explains, “Depending on what type of heater I purchase, because I have a few, I will say, sometimes, there may be one heater of mine where it takes way too long to heat up and I don't like that, so I use it not often.” Participants also shared that a challenge is overall concern for safety (n=6), including concern for electrical shock or fire safety. One participant [PEH929], within the Hispanic group, communicated, “My challenge would be that I really don't trust it very fully. I don't trust it fully, so I'm always cautious when it's on. And as I mentioned earlier, the one I have gives off a little bit of a melting plastic, minimal smell odor.”

My challenge would be that I really don't trust it very fully. I don't trust it fully, so I'm always cautious when it's on. And as I mentioned earlier, the one I have gives off a little bit of a melting plastic, minimal smell odor.

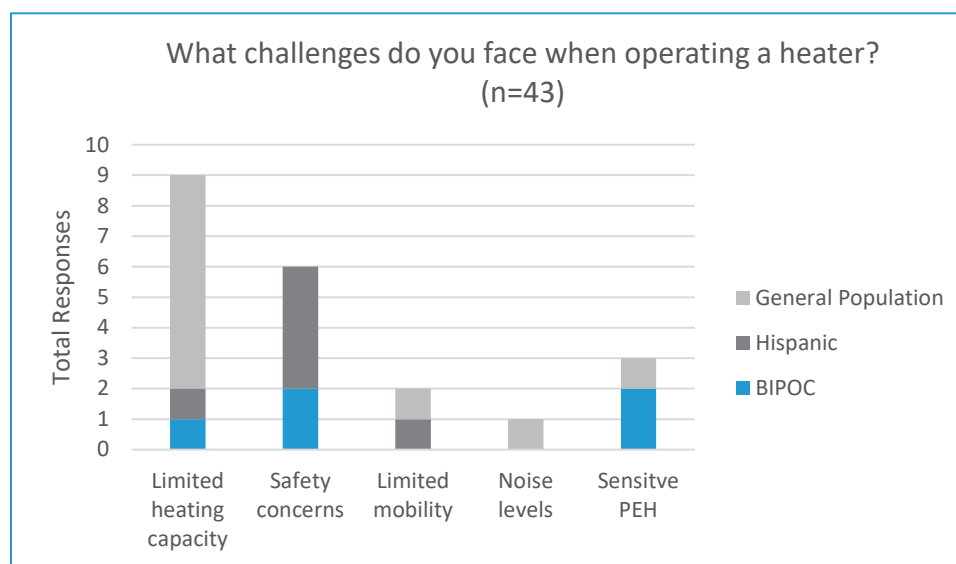
(45-54, Hispanic, Non-Parent, \$70,000 to \$79,999)

Participants also voiced challenges with a “sensitive” heater (n=3). One participant shared that they must angle their heater to function properly due to the tip sensor. Another participant shared their heater turned off automatically (auto shut-off) when it reaches a certain temperature. A different participant explains that their heater turns off after a certain time. The last two

participants expressed uncertainty or lack of knowledge around their heaters' safety features and wattage.

The last two challenges shared are limited mobility (n=2) and noise levels (n=1). For limited mobility, one participant, within the General Population group, described a desire to have a remote control for more accessibility, "I don't want to get up to manually turn it on [heater] all the time." The other participant, within the Hispanic group, similarly described a sensitive heater. Their heater is "broke up a little bit" and functionality is limited due to where they can place it. Figure 26 displays all challenges. It is important to note that these responses represent the number of times a challenge was mentioned within all traditional sessions, rather than the number of participants.

Figure 26. Challenges faced when operating heaters



One participant [PEH095] admitted to more of a personal challenge related to learning how to use their technologically advanced heater. They explained, "Mine is the learning how to use it. Everything's so complicated. And I'm not that dumb, but I'm not that tech-savvy. And I don't want it to take so much time to learn how to use something, it's like I need my brain for other things."

Mine is the learning how to use it. Everything's so complicated. And I'm not that dumb, but I'm not that tech-savvy. And I don't want it to take so much time to learn how to use something, it's like I need my brain for other things.

(45-54, White, Parent, \$20,000 to \$29,999)

If their heater is not functioning some participants try to investigate the cause, however most bypass the frustration and replace or return their heater. When it comes to challenges that they have faced with their heater, participants were quick to respond with limited heating capacity or areas not being warm enough. Participants also responded to having general safety concerns,

which includes fire and electrical safety. It is also important to note that a participant admitted to the challenge of learning how to properly function their heater due to technologically advanced features.

Decision Making

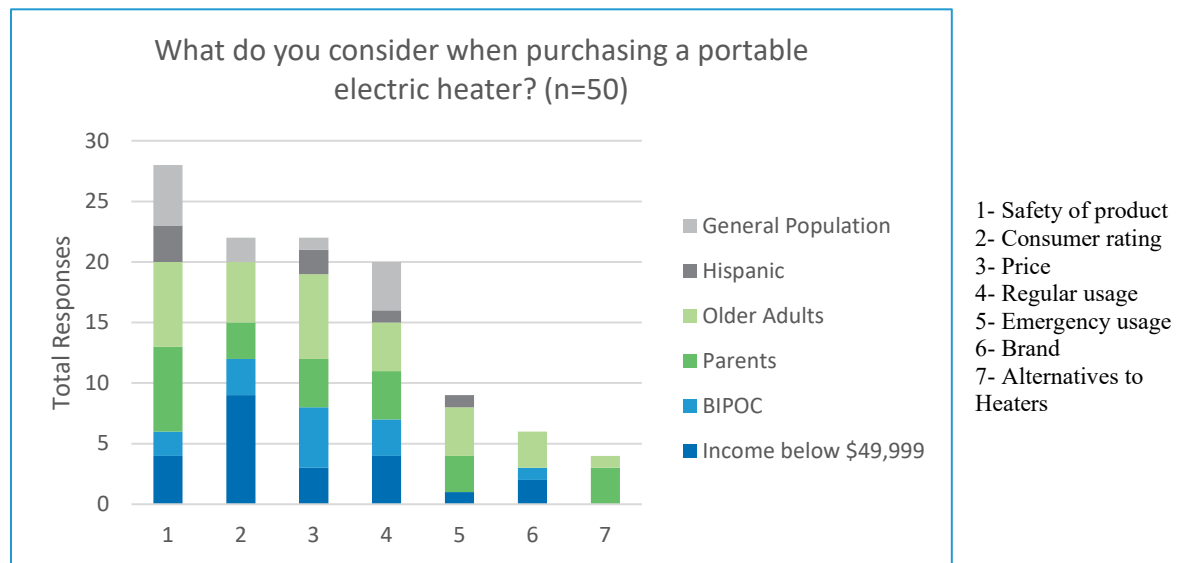
Participants were asked questions to explore their decision making processes for purchasing a heater and to help generate ideas for caution or warning communications that meet different populations' needs.

Purchasing heaters

Participants within the Decision Making groups (n=24) and hybrid sessions (n=26) were asked what factors they consider when deciding which heater to purchase. Various factors were brought up during these conversations as priorities for when participants purchase a heater. Listed below are seven factors that surfaced, presented from most to least frequently mentioned, with further details that explored these factors:

1. **Safety of product:** Considered factors such as tip-over protection, overheat protection, and fire-safety certifications to ensure the well-being of their households.
2. **Consumer rating:** Considered the experiences and opinions of other consumers (e.g., Target, Amazon, Walmart reviews); studying product reviews and ratings to assess the quality, reliability, warranty, and performance of the heater (e.g., does not smell like gas) before deciding.
3. **Price:** Considered the affordability of the heater, comparing its cost with other available options to determine value for money.
4. **Regular usage:** Evaluated the suitability of the heater for daily or frequent use as a primary or supplemental heating source in their homes or offices. This includes looking at the heater features, such as size, area of coverage, and wattage.
5. **Emergency usage:** Considered the capability of the heater to provide reliable warmth in emergency situations, such as power outages or heating system failures.
6. **Brand:** Considered brand names that are recognized as reliable.
7. **Alternatives to Heaters:** Explored alternative heating options (e.g., central heating systems, fireplaces, electric blanket) to assess whether a heater was the most suitable choice for their heating needs.

In addition, three participants responded vaguely that an important factor is an efficient heater. Figure 27 displays the responses. It is important to note that the figure below represents the number of times a participant mentioned a factor within all traditional sessions, rather than the number of participants.

Figure 27. Factors considered when purchasing heaters

As demonstrated in the figure above, the initial four factors had a higher frequency in responses as the most important in the decision making process for purchasing a heater across all populations. Participants responded to the first factor (Safety of product) 28 times. Followed by 2- Consumer rating and 3- Price mentioned, 22 times each. 4- Regular usage was cited 20 times across all populations. One participant [PEH237], within the General Population group, shared they considered at least two of the top four factors in their purchase, “I consider customer ratings and the one safety feature that I have to buy a space heater is that it has a shutoff if it falls over.” A different participant [PEH202], within the Income below \$49,999 group, also encompassed various factors within their considerations and explained their reasons, “I myself will check reviews. I’ll go online on Amazon or Target or Walmart, what have you. People are just brutally honest. Does this product work? If I’m going to shell out this money, whether I go cheap or not, is it going to be effective? Then the other thing is also safety too. For me, I live in Wisconsin. Winters get pretty darn cold up here. You can leave a gallon of milk in the window; it’ll be frozen ice before you get back.”

I myself will check reviews. I'll go online on Amazon or Target or Walmart, what have you. People are just brutally honest. Does this product work? If I'm going to shell out this money, whether I go cheap or not, is it going to be effective? Then the other thing is also [sic] safety too. For me, I live in Wisconsin. Winters get pretty darn cold up here. You can leave a gallon of milk in the window; it'll be frozen ice before you get back.

(24-34, White, Non-Parent, \$40,000 to \$49,999)

While the remaining three factors (5- Emergency usage, 6- Brand, and 7- Alternatives to Heaters) were each mentioned fewer than 10 times, they still showcase valuable considerations. For 5- Emergency usage, one participant [PEH366], within the Older Adults group, stated, “Emergency was very important because a lot of times if you have an outing, and maybe the

thermostat's not working, so emergency use is always important to us.” As for 6- Brand, one participant [PEH016], within the Income below \$49,999 group, shared based on experience, “I made sure it was like a named brand because I did have a different one that was an off-brand and it just didn't work too great.”

Furthermore, participants within the Decision Making groups (n=26) were explicitly asked where they look when purchasing or obtaining a heater. Participants across all populations emphasized the factor of consumer reviews and research by means of online media between local retailers' websites and online retailers' websites. One participant [PEH103], within the BIPOC group, communicated, “I look to see what [discount store company] have, and then that coupon helps tremendously that they send out. And I judge it to see if [redacted] have it against them. And I look for the greatest rate between those two.”

I look to see what [discount store company] have, and then that coupon helps tremendously that they send out. And I judge it to see if [redacted] have it against them. And I look for the greatest rate between those two.

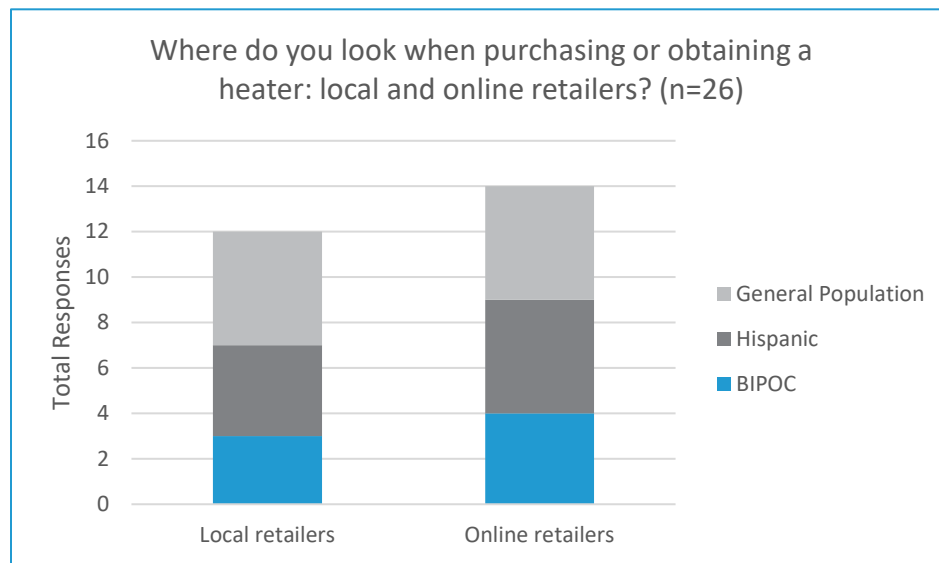
(55-64, African American, Parent, \$60,000 to \$69,999)

In addition, participants responded that they go directly to the local retailers when purchasing or obtaining a heater. A number of participants responded that they do a mix of comparing online reviews and going in person. For example, one participant [PEH1557], within the Hispanic Group, shared, “Yeah, usually brick and mortar stores, [redacted]. Even [redacted], they carry great selections. Then you do your research online comparing. You're on your phone at the brick and mortar, and you're doing your research on the phone there as well.”

Yeah, usually brick and mortar stores, [redacted]. Even [redacted], they carry great selections. Then you do your research online comparing. You're on your phone at the brick and mortar, and you're doing your research on the phone there as well.

(45-64, Hispanic, Parent, \$100,000 or more)

Figure 28 shows the total responses to where they purchase a heater, either from local or online retailers. It is important to note that the figure below represents the number of times a participant mentioned a factor within all Decision Making groups, rather than the number of participants. This question was not asked directly to participants within the Parents, Older Adults, or Income below \$49,999 groups.

Figure 28. Purchase Heaters: Online and Local Retailers

A few participants, even outside of the Decision Making groups, also mentioned other sources of where they purchase or obtain a heater. One participant, within the Parent group, shared that they looked directly at the manufacturer's website. One General Population participant noted that they look at popular second-hand online marketplaces. Another participant, also within the General Population group, directly mentioned looking for referrals on a popular social media website.

Purchasing Factors

Participants from the Decision Making group (n=26) were asked about factors they consider when determining their *choice* of heater for purchase, aside from the type of retailer. Listed below are five factors that surfaced from most to least frequently mentioned.

1. Safety Features
2. Energy Efficiency
3. Reviews and Recommendations
4. Heating Capacity
5. Brand Reputation

Participants highlighted the importance of **safety features** when choosing a portable electric heater. Two participants emphasized the importance of automatic shut-off mechanisms in cases of overheating. Another participant underscored the significance of tip-over protection, while a different individual valued heaters that remained cool to the touch. Moreover, two participants considered avoiding heaters with potentially hazardous components like mesh or wires in the front, particularly when there were small children in the household. Additionally, one participant factored in the heater's ability to cover a specific square footage as a safety consideration. Lastly, two participants stressed the importance of safety features such as thermostats and reviews in their decision making process. In total, safety features emerged as a crucial consideration for these participants.

Seven participants emphasized **energy efficiency** as another important factor in their choice of heater. One participant considered power consumption as a top priority due to electrical issues in their apartment, which led to blackouts. This consideration stemmed from a desire to avoid overloading specific outlets. Additionally, this participant mentioned the importance of the heater's material, ensuring it remains safe to touch. Two participants highlighted the need for energy-efficient heaters since they run them for extended periods during the winter, emphasizing the importance of not overheating or consuming excessive power.

Furthermore, one participant stressed the significance of **noise level and energy efficiency** when selecting a heater, as their apartment had peculiar wiring, making power consumption a critical concern. One participant factored in energy efficiency when deciding between heating their office or a larger living room, aiming to avoid energy wastage. A participant [PEH1003], within the Hispanic group, gave further explanation on why energy efficiency is important to them, “For me, I look for power consumption. Because my apartment's wired weird, so if I plug it into one of my living rooms outlets, it will literally make a blackout happen. We had it happen, and we kind of figured out that's the one thing that's pulling too much power. So now we have little steps that has their own outlets, so we have to connect it to that one, because that one's wired to the kitchen. So that won't make the power kind of blackout. It's something that I have to take into consideration now, especially since I do have my fan in the living room.”

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(25-34, Hispanic, Non-Parent, \$80,000 to \$89,999)

Several participants (n=5) placed great importance on **reviews and user feedback** when considering which heater to purchase. One participant emphasized the significance of reviews and product descriptions, particularly appreciating online retailers' comparative features. Similarly, another participant mentioned a reliance on user reviews in the past, even though recent concerns about biased or incentivized reviews have made them less dependable. For an additional participant, trust was a crucial factor, highlighting their confidence in a space heater due to its safety features and quality, particularly since they purchased it from a popular national wholesaler warehouse. Another participant also considered previous reviews as a crucial element in their decision making process, along with factors like cost and safety features. Overall, these participants valued the insights and experiences shared by others through reviews and product descriptions when making their heater purchasing decisions. One participant [PEH335], within the BIPOC group, provided details on what they look for in terms of reviews, “Reviews and the item description and how [redacted] has where they do comparisons. I also look at that to see which one is better.”

Reviews and the item description and how [redacted] has where they do comparisons. I also look at that to see which one is better.

(25-34, African American, Non-Parent, \$30,000 to \$39,999)

Regarding the **heating capacity** of portable electric heaters, three participants shared their considerations. One participant mentioned their preference for a heater that doesn't consume excessive energy, especially when they only need to warm a smaller space, such as their office. Another participant focused on factors related to space and heating speed. They emphasized the significance of a heater's ability to heat up a room quickly and efficiently. Lastly, an additional participant emphasized tailoring their choice of heater based on the specific area they needed to heat. A participant [PEH1521], within the Hispanic group, gave more detail on the heating capacity factor, "For me it would be the space. How much – how fast it will heat up the place and how long I would use it."

For me it would be the space. How much—how fast it will heat up the place and how long I would use it.

(35-44, Hispanic, Parent, \$20,000 to \$29,999)

Four participants specifically mentioned **brand reputation** as a considering factor. Three participants mentioned a similar shopping strategy where they bring their phones with them when shopping. A participant [PEH339] provided detail on this strategy, "I bring my phone with me when I go shopping. Whenever I look for a product, I actually go to the website of the product, so the brand. That's where I get most of the information. Because it's kind of hard, you're going to go item-by-item, and reading the whole description on a box. I actually like to look at, for example, [redact]. You search for the product name on the box, and then you go onto the website. Obviously, the specific website is going to give you all the information, not like an [redact] or anything like that, but the make website. Most of the information is going to be there, and it's to their benefit to provide everything, that kind of detail. So, as I'm shopping, I actually bring my phone and just do my homework and take my little time to make sure I choose the right product." They prefer to access product information from the brand's website rather than reading the detailed descriptions on product boxes. This approach saves them time, as they can simply search for the product name on the box, and then visit the brand's website for comprehensive information.

I bring my phone with me when I go shopping. Whenever I look for a product, I actually go to the website of the product, so the brand. That's where I get most of the information. Because it's kind of hard, you're going to go item-by-item, and reading the whole description on a box. I actually like to look at, for example, [redact]. You search for the product name on the box, and then you go onto the website. Obviously, the specific website is going to give you all the information, not like an [redact] or anything like that, but the make website. Most of the information is going to be there, and it's to their benefit to provide everything, that kind of detail. So, as I'm shopping, I actually bring my phone and just do my homework and take my little time to make sure I choose the right product.

(45-54, White, Parent, \$60,000 to \$69,999)

Additionally, one participant trusts certain national retailers to curate high-quality products. This participant relies on the store's reputation and generous return policies, believing that products stocked at such stores are likely to be reliable. Moreover, another participant highlighted the importance of product warranties and company reputation. In summary, these four shoppers prioritize obtaining detailed product information and ensuring they make informed choices.

Past Experiences

Participants from the Hybrid (n=24) and Decision Making group (n=26) were invited to share their past experiences using heaters. Please note that all participants were asked the question, but not all of them provided responses during the focus group discussion.

The participants that did share their experience had diverse experiences to share. Six participants mentioned they had a negative experience with heaters. Among these, two participants recounted incidents where their heater and electrical cord caught fire, and in one of these cases, the fire also extended to the wall. One participant expressed dissatisfaction with the fan feature, stating that it was too loud for their preference. The three remaining participants had negative experiences relating to the durability and efficiency of their heater. One participant explained that they must purchase a new heater every year. Another participant noted that the heaters they had purchased were consistently inefficient. The final participant described an issue with their heater, noting that it does not effectively heat the room, especially when their pipes burst, and they found it to be less sturdy in such situations. This participant [PEH433], within the Income below \$49,999 group stated, "When our pipes burst in this bathroom, it doesn't heat very well. I think, like [redacted participant's name] was saying, it was just a supplemental heat source. And the other space heater we had in there did not seem as safe or as sturdy."

When our pipes burst in this bathroom, it doesn't heat very well. I think, like [redacted participant's name] was saying, it was just a supplemental heat source. And the other space heater we had in there did not seem as safe or as sturdy.

(25-34, White, Parent, \$50,000 to \$59,999)

Six participants shared their positive experiences with heaters. One participant shared a memory of buying a heater with their father during the winter. Four participants mentioned that they appreciated the ability to control the temperature, with one of them specifically mentioning their enjoyment of the "forced air" aspect of the heater. One participant [PEH343], within the Income below \$49,999 group recounted a particular experience where they had left their heater on for an entire weekend, and upon their return, it was still running. They described their situation, "This is actually a good experience, one that could have been very, very bad, but it turned out not to be, so it was good. I have two heaters. One of them I have is an oil-filled radiator heater, a portable one at that. I left my home for a weekend, and I completely forgot to shut it off and I came back two days later, it was still on."

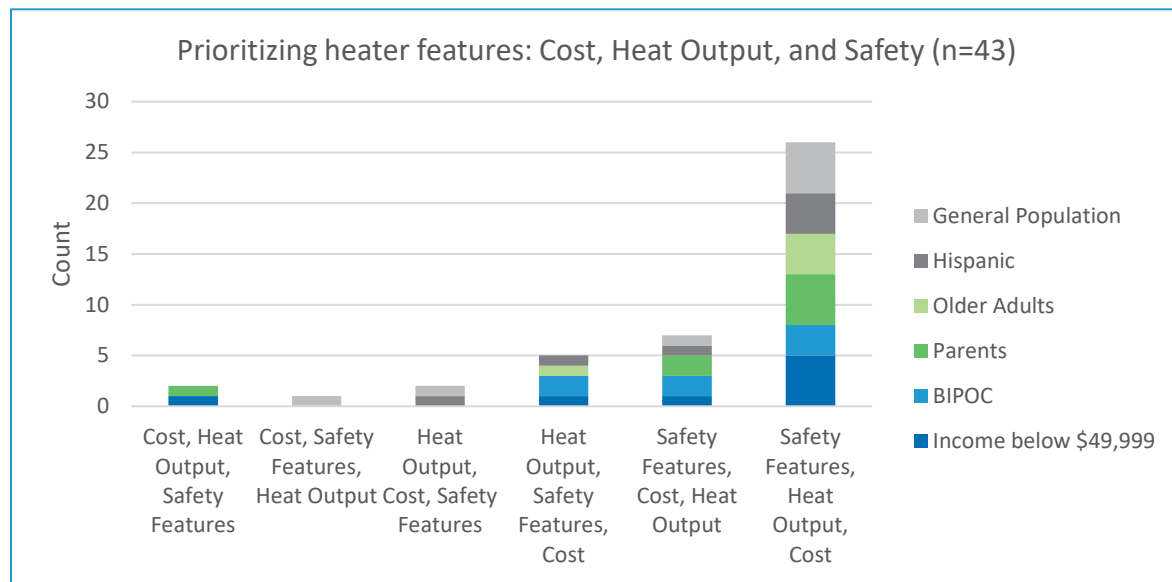
This is actually a good experience, one that could have been very, very bad, but it turned out not to be, so it was good. I have two heaters. One of them I have is an oil-filled radiator heater, a portable one at that. I left my home for a weekend, and I completely forgot to shut it off and I came back two days later, it was still on.

(35-44, White, Non-Parent, Less than \$20,000)

Among those who shared, diverse experiences emerged. Six participants had negative encounters with heaters, including two incidents of fire caused by the heater and cord; a complaint about excessive fan noise; and concerns about durability and efficiency. Conversely, six participants shared positive experiences, including heartwarming memories of purchasing a heater with family, appreciation for temperature control, and an absorbing anecdote about a heater running uninterrupted for an entire weekend. These contrasting viewpoints indicate there are mixed experiences of individuals with heaters.

Importance of Factors – Polling Questions

Participants from all traditional sessions (Knowledge and Practices groups (n=19) and Decision Making groups (n=26), were asked to rank the importance of three key factors when comparing heaters: Cost, Heat Output, and Safety Features. The participants' task was to establish a hierarchy among these attributes in the virtual meeting chat. **Error! Reference source not found.** displays the results of the participants' ranking of the attributes. It is important to note that responses represent the number of time responses were mentioned within all traditional sessions, rather than the number of participants.

Figure 29. Prioritizing heater features

By far, the preferred ranking order among the three attributes was as follows: Safety Features ranked first, followed by Heat output in second place, with Cost coming in third. This order was written by 26 participants. Seven more participants ranked Safety Features as their top priority. However, their last two attributes were ranked as follows: Cost came second, and Heat Output was rated third.

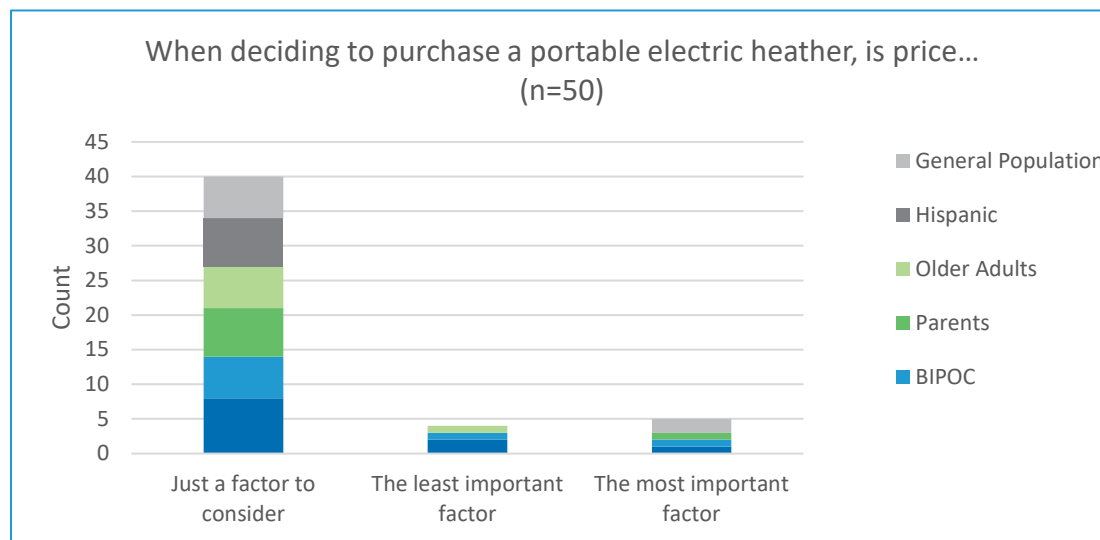
Seven additional participants prioritized Heat Output as their primary factor when comparing heaters: Among these, three participants ranked Safety Features as second and Cost as third, while the other two ranked Cost as second and Safety Features as third. Three of the remaining participants considered cost as their top priority, with one ranking Safety Features as second and Heat Output as third. The remaining two participants placed Heat Output second and Safety Features third. Out of all 43 participants who provided these responses, only two ranked Safety Features as their least important factor when comparing heaters.

Five participants provided chat responses that differed from the standard order of ‘Safety Features, Heat Output, and/or Cost,’ as shown in Table 9. Among these participants, three emphasized the significance of “safety” and “Safety Features” as their top priority. One BIPOC participant prioritized their attributes as “Safety Features, Quality, Cost,” while another BIPOC participant's response was “Cost, Safety Features, and Quality.” Among the two Income below \$49,999 participants, one did not mention safety in their responses but included Heat Output as their third most important factor out of the four options they wrote, which were “Energy, Efficiency, Heat Output, Noise Level.” The other Income below \$49,999 participant wrote, “Safety features: Most important; Heat Output: Not less important! Cost: Not irrelevant, but not necessarily determinative.”

Table 9. Prioritizing heater features - alternative

Prioritizing Heater Features: Other Responses (n=5)	
<i>Participant Group</i>	<i>Response</i>
Income below \$49,999	Energy Efficiency, Heat Output, Noise Level
Income below \$49,999	1) Safety Features; Most important, 2) Heat output: Not less important! 3 Cost: Not irrelevant, but not necessarily determinative.
Income below \$49,999	Safety, Longevity, Cost
BIPOC	Safety Features, Quality, Cost
BIPOC	Cost, Safety Features, Quality

Participants were additionally prompted with a poll regarding price and its impact on purchasing a heater. Figure 30 displays the poll results regarding the purchase of portable electric heaters, respondents were asked to weigh the significance of price in their decision making process. The response options provided ranged from considering price as the foremost determining factor to viewing it as a secondary consideration in their choice of heater. It is important to note that responses represent the number of times responses were mentioned within all traditional sessions, rather than the number of participants.

Figure 30. Price impact on heater purchase

A majority of the participants (n=40) considered price as a relevant factor when purchasing a heater, but it was not deemed the most or least important factor. Only five participants ranked price as their top priority, whereas the remaining four participants considered it the least important factor. It is important to note that one BIPOC participant did not respond to this poll. One participant [PEH129], within the Older Adults group, gave their reasoning for voting that price is the least important factor, they explained, “I mean, there's heaters for \$49, there's heaters for \$299, \$399. It just depends on what you want. There are all different kinds. I think just

because something's less expensive doesn't mean you're not going to get a quality product. It just depends.”

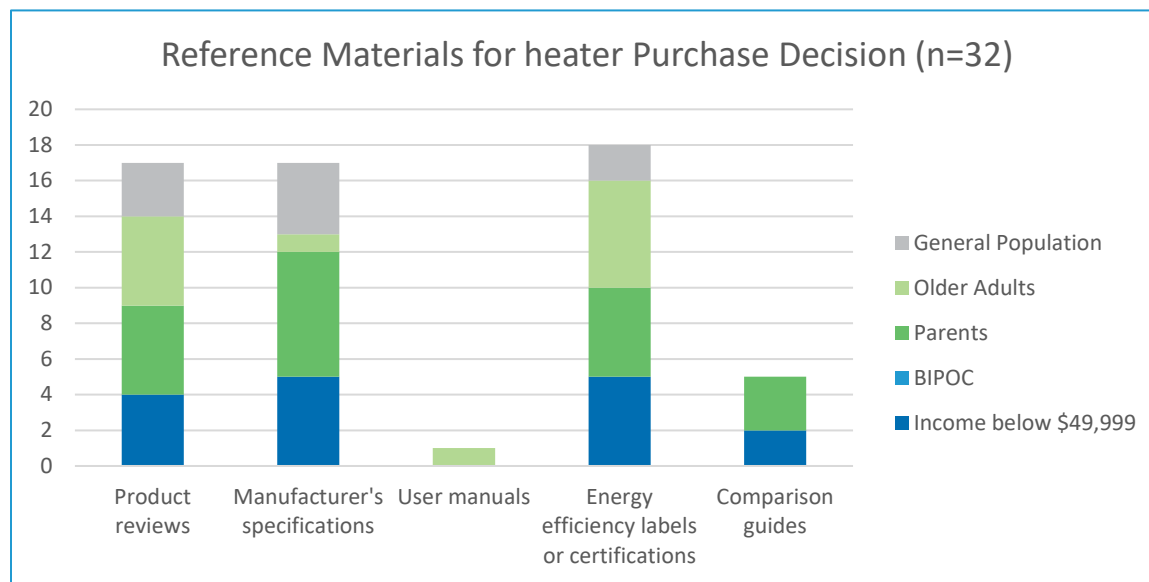
I mean, there's heaters for \$49, there's heaters for \$299, \$399. It just depends on what you want. There are all different kinds. I think just because something's less expensive doesn't mean you're not going to get a quality product. It just depends.

(55-64, White, Parent, \$90,000 to \$99,999)

References to Safety and Warning Messages

Participants from the Hybrid (n=24) and Decision Making group (n=26) were asked about the written material they reference when considering a heater purchase. Figure 31 showcases the most frequently encountered participant responses from the group discussions. It is important to note that the figure below presents the number of times a specific type of reference material was mentioned within all Hybrid and Decision Making groups, rather than the number of participants.

Figure 31. Participants' reference materials for heater purchase



Seven participants emphasized the significance of product reviews, particularly mentioning popular online search engines. Additionally, one participant stated that they initially rely on word-of-mouth recommendations when deciding on a heater purchase, and subsequently, they turn to online sources for further information. Another participant mentioned that their decision making process depends on time constraints. If they urgently need a heater, they will visit a physical store and quickly read the box to check for features. However, when they have more time, they prefer to use online retailers, where they read customer reviews. A participant [PEH120], a member of the Income below \$49,999 group, provided insights into their information sources and criteria, stating: “I would also go online like different websites. I would

usually go to a certain product that I'm looking to purchase and check the safety features and check the pros and the cons about it.”

I would also go online like different websites. I would usually go to a certain product that I'm looking to purchase and check the safety features and check the pros and the cons about it.

(25-34, African American, Parent, \$20,000 to \$29,999)

Participants also noted that they reference the manufacturer's specifications. Additionally, a subset of participants (n=5) mentioned specifically looking at information related to warranty and safety issues. Furthermore, an additional group of participants (n=4) mentioned that they actively seek out products with an auto shut-off feature. Another feature that participants (n=3) discussed as important in their decision making process is energy efficiency. One participant mentioned that they specifically prioritize energy efficiency because in their state, energy bills can escalate quickly. Among the participants, only one participant mentioned referring to the user manual for information.

In summary, participants place significant reliance on product reviews and manufacturer specifications, with a particular emphasis on safety features and energy efficiency. This sentiment was well-captured by a participant [PEH1063] in the Income below \$49,999 group, who expressed, “Whenever I find a heater that I like, I'll usually wait to buy it until I read reviews and things like that on it. And while I'm in store looking at it, I'll make sure it has the features I like. But before I make any purchase, I like to read the reviews on it.”

Whenever I find a heater that I like, I'll usually wait to buy it until I read reviews and things like that on it. And while I'm in store looking at it, I'll make sure it has the features I like. But before I make any purchase, I like to read the reviews on it.

(25-34, Two or more races, Parent, \$70,000 to \$79,999)

Reference Recalls

Participants from the Decision Making group (n=24) were asked whether they checked for recalls before buying their heater. Four participants indicated that they actively check for recalls before purchasing a heater. One participant mentioned that a recall serves as a red flag for them, prompting caution. Another participant checks for recalls to understand why a heater might have been recalled. Two additional participants stated that they do so to ensure they are acquiring the best possible product, with Participant PEH346, within the Older Adults group, elaborating on their perspective, “And again, online, but looking for recall notices, doing a search for space heater recalls, just to get a sense of whether what I'm considering is in a line that had been recalled, and what was done, just looking at past safety information for a manufacturer or a model.”

And again, online, but looking for recall notices, doing a search for space heater recalls, just to get a sense of whether what I'm considering is in a line that had been recalled, and what was done, just looking at past safety information for a manufacturer or a model.

(55-64, White, Non-Parent, \$100,000 or more)

Conversely, fifteen participants do not check for recalls, citing several reasons for their decision not to do so. The primary reasons participants discussed for not checking for recalls were a lack of time, lack of awareness, and a high degree of trust in the brand.

Seven participants mentioned that they do not think about recalls until they come across advertisements or information on prominent platforms like the news or popular websites such as Amazon. Another participant expressed that they are unsure where to find recall information, while one participant downplayed the significance of recalls, reasoning that with millions of products available, they do not pay too much attention to them.

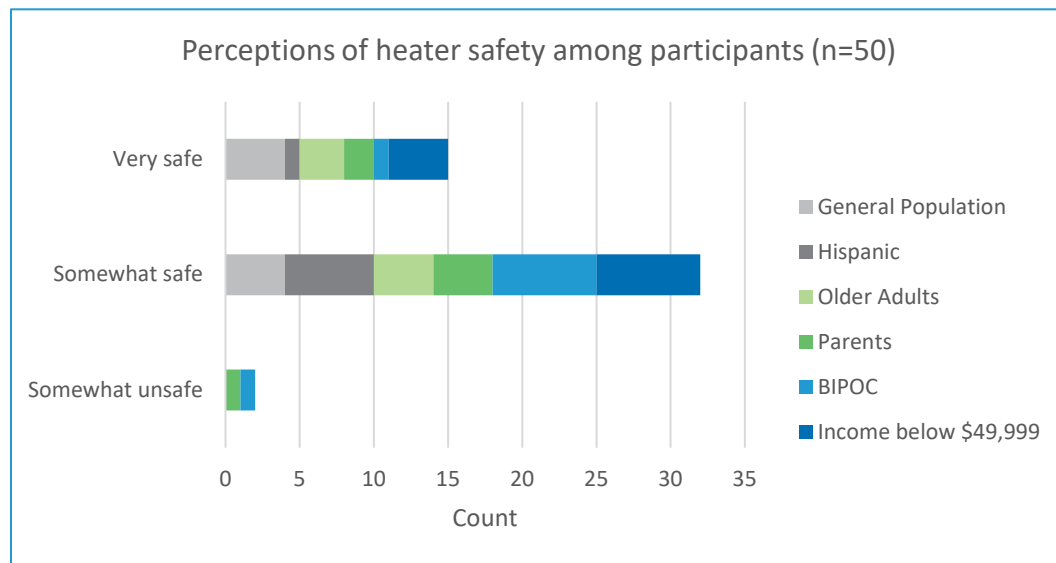
Two participants explained that they refrain from checking for recalls due to time constraints. One participant expressed the belief that such checks consume too much time and effort, while the other admitted to procrastinating to the extent that they eventually forget to check altogether.

Three participants shared that they do not check for recalls because they have a high level of trust in the brand they are purchasing from. Two participants explained that if the product is not safe, it would not be available on the shelf. Another participant mentioned their reliance on well-known brand names and avoidance of unfamiliar ones. Additionally, one participant mentioned their trust in a specific national warehouse retailer, which has a reputation for notifying customers about recalls, although they personally have not encountered any recalls from them. Trust in both brands and retailers can influence consumers' recall-checking behaviors.

In conclusion, participants' approaches to checking for product recalls varied widely. Some relied on external sources like news or popular websites to bring recalls to their attention, while others cited time constraints, indifference, or a strong brand and retailer trust as reasons for not actively seeking recall information. In summary, people have varied reasons for how they handle recalls, and it's crucial to have effective ways to share recall information.

Safety and Warning Messages – Polling Questions

Participants from both traditional sessions, including the Knowledge and Practices groups (n=19) and Decision Making groups (n=24), were presented with two polling questions. Figure 32 displays the poll of participants' perceptions of the safety of portable electric heaters. Respondents were given the choice to express their level of confidence in these heaters' safety, with options ranging from considering them "very safe" to "somewhat safe," or, conversely, deeming them "somewhat unsafe" or "very unsafe."

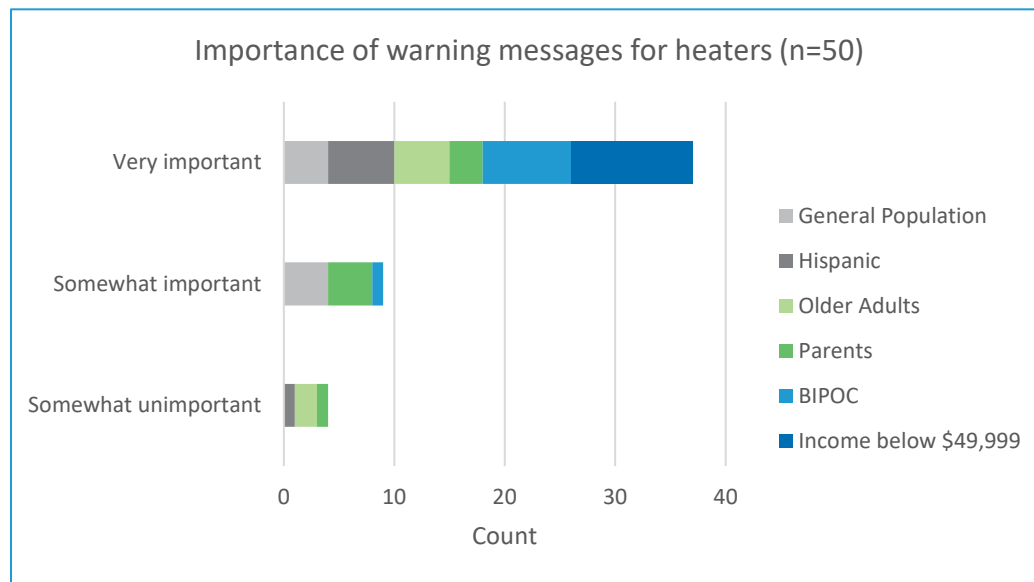
Figure 32. Perception of heater safety

In terms of the participants' perception of heater safety. Over half of the participants (n=32) voted that heaters were somewhat safe. While fifteen participants voted that heaters are very safe. One participant [PEH311], within the Income below \$49,999 group, voted that heaters are very safe and provided some insight on why they thought so, they explained, "I've actually really never had one malfunction or even threatened to do something dangerous. So, from my personal opinion, I mean obviously you have to use common sense, like not stick it in a bathtub at the waterfall." Only two participants voted that heaters were somewhat unsafe.

I've actually really never had one malfunction or even threatened to do something dangerous. So, from my personal opinion, I mean obviously you have to use common sense, like not stick it in a bathtub at the waterfall.

(55-64, White, Non-Parent, Less than \$20,000)

Participants were additionally asked to share their perspective on the importance of warning and caution messages accompanying portable electric heaters. Respondents had the opportunity to rate the significance of these messages on a scale ranging from "very important" to "not important at all." Please note that not all response options were selected by participants, which is why some options are not displayed on the chart. Figure 33 illustrates the results.

Figure 33. Importance of warning messages for heaters

Most of the participants (n=37) indicated that warning or caution messages are very important. Thirteen of the remaining participants voted that these messages were either somewhat important (n=9) or somewhat unimportant (n=4). Notably, none of the participants voted that these messages are not important at all.

A participant [PEH1063], within the Parents group, provided a comment on why they voted somewhat important, “I think they're somewhat unimportant just because if you use common sense, you can avoid most problems. But for those few people who really need the reassurance and need to read to know exactly what to do, it's helpful for them, but not for everybody.”

I think they're somewhat unimportant just because if you use common sense, you can avoid most problems. But for those few people who really need the reassurance and need to read to know exactly what to do, it's helpful for them, but not for everybody.

(25-34, Two or more races, Parent, \$70,000 to \$79,999)

Assessing Safety and Warning Messages

Participants in the Decision Making (n=26) and Hybrid group (n=24) were asked if they read the warning or caution messages when they purchase or set up their heater for the first time. Of the participants that responded, four individuals mentioned that they read the warning or caution messages when setting up their portable electric heaters for the first time for safety reasons, highlighting the importance of ensuring safe usage. Additionally, four participants noted that they read these messages to understand the features and how to use them correctly, ensuring they are using the product to its full potential. This is best described by a participant [PEH274] within the Income below \$49,999 group, “I want to make sure I’m using it right and I want to make sure it’s safe in my house. Because some people have had some bad experience with space heaters, so

I want to make sure I'm doing the right thing with mine.” Overall, participants’ motivations for reading these messages appear to revolve around safety, understanding the product, and ensuring responsible usage.

I want to make sure I'm using it right and I want to make sure it's safe in my house. Because some people have had some bad experience with space heaters, so I want to make sure I'm doing the right thing with mine.

(25-34, African American, Parent, \$40,000 to \$49,999)

Nine individuals shared that they do not read the warning or caution messages when initially setting up their portable electric heaters. Their reasons vary, with some participants emphasizing the use of “common sense” as their guiding principle. For instance, one participant mentioned relying on common sense and an additional participant expressed a preference for using common sense rather than reading such messages. Additionally, two participants pointed to their past experiences and safety-conscious habits, which inform their decision to skip these messages. One other participant explained that they often skip reading warnings and instructions since they are already familiar with the basic heater functions. Two other participants conducted thorough research before purchasing their heaters, which led them to overlook the warnings provided. Participant [PEH398], within the Older Adults group gave more insight on why they do not read the caution or warning messages, “I did the research as well, and so I didn't really look at the instructions. I, of course, looked at the back, kind of safety concerns, kind of skimmed over it, but I didn't read it in-depth. Mainly because I thought I'd pretty much done the research.” Overall, these participants tend to rely on personal judgment, past knowledge, and prior research, rendering the provided warnings less important, in their view.

I did the research as well, and so I didn't really look at the instructions. I, of course, looked at the back, kind of safety concerns, kind of skimmed over it, but I didn't read it in-depth.

Mainly because I thought I'd pretty much done the research.

(65-74, White, Non-Parent, \$80,000 to \$89,999)

Suggestions on Heater Warning Messages

Participants within the Decision Making (n=26) and hybrid sessions (n=24), for a total of 50, were asked if there were any warnings that heaters should have. Participants that responded proved to be knowledgeable on several warning statements. In addition, the suggestions provided also referenced known warnings (e.g., warning of flammable objects, child safety). In total, participants mentioned or suggested eleven precaution messages that heaters should or should already have. Four warnings were mentioned more than six times:

1. **Flammable material:** Refers to warnings or precautions related to keeping the heater away from flammable objects or materials. They also discussed the potential for the heater to generate heat that could pose a fire hazard, as well as the need to keep the area around the heater clear of dust and debris. Some participants suggested including information about the appropriate distance from flammable objects in the heater's warning labels or instructions.
2. **Unattended operation:** Refers to warnings or precautions related to leaving the heater unattended or unsupervised. Participants mentioned the importance of not leaving the heater on while they are away or asleep, as well as the need to unplug it when leaving the house or going on vacation. Another comment was avoiding using the heater for extended periods of time without being present. The concern is primarily about safety and the risk of fire or other hazards that could occur if the heater is left unattended for long periods.
3. **Electrical compatibility:** Refers to warnings or concerns about the electrical features of the heater, such as wattage, voltage, and potential impact on the electric supply or circuit. Participants mentioned considering the wattage and compatibility of their heaters with other devices, such as phones, and the need for warnings or information about electrical safety and potential risks. Other concerns were about the voltage compatibility, especially for international use.
4. **Ventilation reminder:** Highlighted the importance of keeping the heater in an open space and maintaining proper distances from walls, curtains, and other objects, ensuring proper airflow and prevention of overheating.

Several participants (n=12) voiced that heaters should have a warning about flammable materials, such as “Keep the heater at least three feet away from any flammable materials such as curtains, furniture, or bedding to reduce the risk of fire.” Interestingly, this warning or suggestion was brought up in conversation specifically by the General Population, Older Adults, and Parents populations.

The next three warnings or suggestions had a mix of representation. Participants communicated that heaters should or should already have precaution messages about not leaving heaters unattended (n=8) and checking electrical compatibility (i.e., wattage and room size) of heaters with outlet (n=8). The fourth warning/suggestion is a ventilation reminder (n=7). For example, “Ensure proper ventilation by not blocking the air intake or output vents to maintain optimal performance and prevent overheating.”

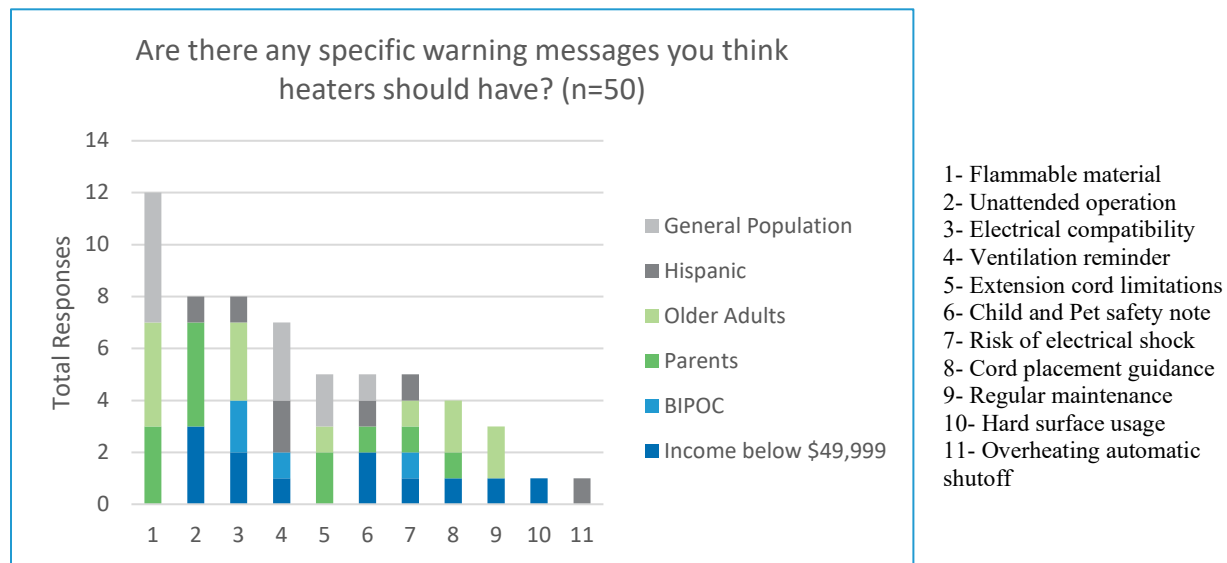
Participants mentioned the remaining seven warning statements/suggestions fewer than six times each.

5. **Extension cord limitations:** Refers to the safety guidelines that advise against connecting electrical devices, such as heaters, to extension cords. The use of extension cords can increase the risk of electrical accidents and fires. They emphasized plugging devices directly into an outlet to ensure proper electrical connection and minimize potential dangers. “Avoid using extension cords with portable electric heaters as they may overheat; always plug the heater directly into a wall outlet.”
6. **Child and pet safety note:** Refers to the inclusion of warnings or instructions on heaters to ensure the safety of children and pets. This may include emphasizing that heaters are not toys and should not be played with by children, as well as advising on how to keep

heaters out of reach of curious children or pets. Additionally, some heaters may have a tip-over switch that automatically turns off the heater if it is knocked over, which helps prevent accidents and potential injuries. “Keep the heater out of reach of children and pets to prevent accidental contact or tipping over.”

7. **Risk of electrical shock:** Participants expressed the importance of warning labels that specifically address the risk of electric shock associated with using heaters near water or in damp areas. “Do not use the heater near water or in damp areas to avoid the risk of electric shock.”
8. **Cord placement guidance:** Refers to the importance of cord placement guidance in heater safety guidelines. Participants emphasized the power cord should be kept away from high-traffic areas to avoid accidental tripping or pulling of the cord. “Keep the power cord away from high-traffic areas, ensuring it is not pinched, crushed, or damaged, to prevent electrical malfunctions or hazards.”
9. **Regular maintenance:** Relates to the importance of cleaning the device regularly to prevent the accumulation of dust and debris, which can potentially affect its functionality. Participants highlighted the need to follow the manufacturer's instructions for proper cleaning methods and frequencies. “Clean the heater regularly according to the manufacturer's instructions to prevent the accumulation of dust and debris, which could impact its functionality.”
10. **Hard surface usage:** Refers to the importance of selecting an appropriate location for the heater. Participants emphasized the need to avoid placing the heater on carpets or rugs, as these soft surfaces can obstruct airflow and potentially cause overheating. By placing the heater on a stable and non-flammable surface, such as the floor without any obstructions, the risk of overheating is minimized, “Place the heater on a stable, non-flammable, and hard surface, avoiding use on carpets or rugs that may obstruct airflow and potentially cause overheating.”
11. **Overheating automatic shutoff:** Refers to the safety feature of the heater that automatically shuts off if it becomes too hot. “This heater is equipped with an automatic shut-off feature that activates if it overheats, but do not rely solely on this function; monitor the heater for any unusual behavior.”

Figure 34 displays the responses. It is important to note that the figure below represents the number of times a participant mentioned a warning or had a suggestion, rather than the number of participants.

Figure 34. Suggestions for warning messages

One participant [PEH236], within the Income below \$49,999 group, did not respond with specific warnings or suggestions. They vaguely responded with, “I don't think that there are any that it doesn't already have.”

Overall, participants were knowledgeable on a variety of warning messages that heaters should or should already have displayed on the product itself or instruction manuals.

Closing Comments

Participants from all focus groups and sessions were asked about what they liked the most about heaters, their concerns, and what suggestions they have to make heaters safer.

Advantages of Heaters

All populations (n=69) were asked what they liked most about heaters. Four main advantages surfaced from this discussion: convenience, quick heating, cost-effectiveness, and energy efficiency. Participants across all populations stated that convenience (n=42) was the top reason they liked heaters, explaining that heaters were convenient because they were “easy to use” since they are “portable” and can be moved around. Moreover, they appreciated the convenience of controlling the temperature in select areas. As one BIPOC participant [PEH334] simply stated, “I like that I don't have to have turn my heat on in my house and I can just do one room at a time.” Another participant [PEH218], within the Older Adults groups, further detailed, “Yeah. I think the fact that you're adding heat to usually, well, always, to me, a much smaller space than the whole house or apartment you live in. So, it's to focus heat where you need it at a particular time and usually a more confined area, so I don't have to heat my whole five rooms when I'm sitting and working in my study for a few hours. I don't have to jack up the temperature in the apartment to do that.”

Yeah. I think the fact that you're adding heat to usually, well, always, to me, a much smaller space than the whole house or apartment you live in. So, it's to focus heat where you need it at a particular time and usually a more confined area, so I don't have to heat my whole five rooms when I'm sitting and working in my study for a few hours. I don't have to jack up the temperature in the apartment to do that.

(75 or older, White, Non-Parent, \$100,000 or more)

This participant's in-depth explanation leads to the second ranked advantage that heaters provide quick heating (n=21). One participant [PEH129], within the Older Adults group, shared, "What do I like best? How they warm up the room quickly." A different participant [PEH1557] in the Hispanic group specified, "I mean, just the fact that I'm able to control the temperature in the house a lot better, without making all the house hot in the wintertime. Just being able to control the temperature in each room is what I really like about it. The type of heaters that I have, I have a set temperature that I could set it to. Once it hits that temperature, it's going to keep blowing to keep the room at that temperature. That's what I really enjoy."

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(45-54, Hispanic, Parent, \$100,000 or more)

The last two advantages – cost-effective (n=12) and energy efficiency (n=8) – were brought in conversation when talking about either of the top two advantages. For example, one BIPOC participant [PEH402] liked the quick heating and cost-effectiveness, "Oh, basically the fast, efficient, quick heating of the space when I feel cold and then keeps the electricity bills low." Another participant [PEH450], within the Income below \$49,999 group, detailed the safety that they like which relates to energy efficiency, "For me, some of them have timers. Well, sometimes, it comes in handy because sometimes I'd be busy and forget to actually turn them off, so the timer itself. And also, when they do tilt over, the shutoff."

For me, some of them have timers. Well, sometimes, it come in handy because sometimes I'd be busy and forget to actually turn them off, so the timer itself. And also, when they do tilt over, the shutoff.

(35-44, African American, Parent, Less than \$20,000)

Concerns for Heaters

All populations (n=69) were asked about their overall concerns about heaters and what suggestions they have to make heaters safer. Based on the group discussions, four distinct themes of concern emerged: fire hazards, electrical safety, burns, and energy/power consumption.

Twenty-six participants expressed concerns related to fire safety and potential fire hazards associated with heating devices. These 26 participants shared apprehensions about the risk of fires starting suddenly, either due to defects in the devices or accidents such as tipping over. Some participants mentioned their anxiety regarding proximity to the heating devices, especially when children or pets were around, fearing accidental contact or overheating. Furthermore, some mentioned worries related to electrical issues, like using the appropriate extension cords and grounding the wires. A participant [PEH334], within the BIPOC group, gave more insight on their fire hazard concern, “I have a dog, and so sometimes I'm worried that she would knock it over or something or drag her little blanket that she uses too close to it. So, I always try to keep it in my eyesight and not super close to me.” The recurring theme across these participants was a heightened awareness of the potential dangers associated with heating appliances and the importance of mitigating fire risks.

I have a dog, and so sometimes I'm worried that she would knock it over or something or drag her little blanket that she uses too close to it. So, I always try to keep it in my eyesight and not super close to me.

(25-34, Asian, Non-Parent, \$50,000 to \$59,999)

A total of 15 participants expressed concerns related to electrical safety issues associated with heating devices. Of these fifteen participants, six participants provided further explanations of why electrical safety was a concern for them. Two participants expressed concerns related to potential electrical issues causing heating devices to malfunction and potentially lead to fires. They mentioned worries about shorts or electrical surges in outlets that could trigger safety risks associated with these devices. Furthermore, one participant specifically highlighted their concern regarding the possibility of heating devices having manufacturer defects, which could pose safety risks, such as sparking or causing fires. Additionally, two participants shared concerns related to the risk of children or pets touching the heating devices and getting burned due to their high temperatures. They emphasized the need for caution in households with young children and animals. Moreover, one participant mentioned concerns about the electrical components of heating devices and the potential for electrical fires, especially when blankets or other flammable materials accidentally come into contact with the device.

Regarding the theme of burns, children were a recurring topic of discussion. Four participants expressed concerns about the safety of children near heating devices. Two participants highlighted worries about younger family members being at risk of touching the devices and getting burned. They emphasized the need for vigilance and supervision to ensure the safety of these young children. A participant [PEH056] within the BIPOC group explained their concern with family members, “My biggest concern is my great nephew. He likes to touch things and I

always tell him not to touch my space heater because it's not for kids. And that's my concern about him because I love him. I just want to make sure he's safe because he's just a kid. He's only five years old. So that's my concern.”

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(35-44, African American, Non-Parent, Less than \$20,000)

Two additional participants mentioned concerns about children, including nieces, nephews, and kids in general, coming into contact with heating devices and potentially getting burned. They suggested the need for safety measures like grid lines that prevent small fingers from touching the device's hot elements. One participant even proposed the idea of incorporating child-proof features to shield children from the heat. In summary, these four participants expressed concerns about the safety of children and the potential risk of burns associated with heating devices.

Concerning the theme of energy and power consumption, several (n=7) participants discussed the impact of heating devices on their electricity bills. Two participants specifically mentioned the impact on their electrical bills, highlighting the need to manage energy usage effectively. One participant expressed a desire for smarter technology integration, suggesting features that allow for better control over energy consumption, such as pairing heating devices with smart plugs to monitor usage and adjust settings based on external factors like weather. Moreover, another participant shared their perspective on managing energy costs and avoiding excessive power consumption. They mentioned concerns about the electricity bill and the potential for heating devices to consume a significant amount of power, particularly when used for extended periods. This participant also discussed the practicality of having a two-in-one heater and fan while being mindful of their energy usage.

In summary, participants demonstrated varying degrees of concern and consideration related to energy consumption and its impact on their bills.

Suggestions for Heaters

Participants also offered suggestions for making heaters safer to use. The main suggestions that arose from the discussion were enhanced safety features, clear warning labels, and an improved cord design. Enhanced safety features were the most common suggestion among participants (n=30). For example, two participants suggested incorporating timers and automatic shut-off features on the heaters. This would allow users to set specific operating durations, enhancing safety and energy efficiency. An additional two participants emphasized the importance of making space heaters safer for homes with children and pets. They suggested adding an outer shield or proximity sensors to prevent accidental burns or fires.

Thirteen participants proposed integrating smart technology into space heaters. They envisioned features like remote control via smartphones, temperature regulation based on weather data, and

notifications to improve user convenience and energy management. Finally, two participants recommended incorporating sensors that detect smoke or overheating, leading to automatic shut-off. This would enhance safety by preventing potential fire hazards. These suggestions reflect participants' desires for safer, more user-friendly, and technologically advanced space heaters that align with modern lifestyles and safety concerns.

Additional recommendations centered on the importance of clear warning labels for space heaters. One participant proposed using bold and vivid colors for these warnings, both on the heater itself and on accompanying websites, emphasizing their significance. Another participant expressed agreement with this emphasis on conspicuous warning labels. Additionally, two participants emphasized the need for longer cords to eliminate the necessity of purchasing and using extension cords, enhancing both convenience and safety.

Conclusion

Despite variations in the focus group sessions and the specific questions/topics discussed with each population, this conclusion summarizes the collective findings from all populations (BIPOC, General Population, Hispanic, Income below \$49,999, Older Adults, and Parents) to provide an overall understanding of the key insights regarding the knowledge and practices, use and behaviors, along with decision making considerations related to the use of heaters.

Knowledge and Practices

Overall, participants across all populations have some knowledge of heater safety and how to use their heaters safely.

- Participants typically own one to three heaters. One or more of these heaters has a fan, are plastic and/or metal, and glows red when turned on.
- When it comes to knowledge and practices around heaters, regardless of population, participants typically use their heater when the conditions outside are colder (e.g., winter and fall months). Most participants reported using their heaters for a few hours daily, typically in the evening, followed by mornings then afternoons.
- Most participants are knowledgeable on various safety tips and precautions when it comes to their heater. More so on when it comes to fire safety, such as keeping clear of flammable objects, not leaving them unattended, and being deliberate of where they place their heater.
- Most participants reported not having a negative experience with their heater. For participants that did have a negative experience, most were benign and could be easily resolved. This includes replacing the heater if it stopped working, picking up the heater if it tipped over, or taking off the obstruction on top or in front of the heater.
- Most participants are aware of warning statements on their heater. Those that are aware of warning statements responded that the messages were “very helpful” and “somewhat helpful.”
- Overall, participants cited that the warning labels are “very clear.” However, for times that it was unclear it was due to lack of knowledge of what icons meant and contradictory messaging (e.g., don’t leave unattended but the heater has auto-shutoff feature). A few participants offered suggestions of clear labelling that heaters need general maintenance.

Another suggestion is that the icons used need to be understandable, perhaps followed by words for clearer translation and communication of the icon representation and of language (non-English to English).

- Participants seek an alternative explanation, such as online tutorials, friends, and family, when they need clarification on warning statements. Participants seek an easy route to reach a solution, as very few mentioned reviewing or reading the unclear message multiple times.
- Most participants' reaction or response to being asked if they were surprised by any warning messages was that the message should be common sense, such as keeping your heater a safe distance from flammable objects, not touching the product when it is on (hot to touch), and the wattage of the heater.

Use and Behaviors

Overall, participants across various populations exhibit some knowledge of heater safety measures, however there are some moderate to extreme risks or behaviors that were presented.

- When it came to the use of heaters around children (or guests) and whether there were any rules involved, several participants did note that they share clear safety guidelines, take childproofing measures, and/or supervise and educate children or guests. This can be seen for both parents and non-parents.
- Moreover, just like the first bullet, participants (parent or non-parent) take precautions of adult supervision (not leaving unattended), keeping a safe distance, no playing, and teaching fire safety and emergency protocol (e.g., burns). One parent even admitted to a radical behavior teaching their children on the emergency protocol of heaters as the "one-finger rule."
- Typically, participants reported that the main room or area in which they use their heaters is their bedroom, followed by living room, home office or study, and cold areas or drafty areas. The latter includes patios, bathroom, and kitchen. The usage of these areas is due to ease of access, including areas of high activity, proper clearance, and ventilation.
- Participants indicated moderate risk behaviors, particularly across Hispanic, General Population, and BIPOC populations, of frequently ("sometimes" to "always") using an extension cord or power strip. These moderate risks are taken due to limited outlet availability and flexibility of placement. However, participants do have a good practice of "never" leaving the heater on when they are not home.
- Participants generally bypassed frustrations and replaced or returned their heaters if they malfunctioned.
- Participants were quick to respond with limited heating capacity, or areas not being warm enough as their primary challenge. Participants also responded to having general safety concerns, including fire and electrical safety. It is also important to note that a participant admitted to the challenge of learning how to properly operate their heater due to technological advancement.

Decision Making

Overall, participants across various populations exhibit a primary concern for safety features when contemplating heater purchases.

- Participants prioritize product safety and consumer ratings when making decisions about purchasing a heater.
- The top factors influencing their heater purchase choices are safety features and energy efficiency.
- Participants have diverse experiences with heaters, including incidents such as fires, heating problems, and durability issues.
- Many participants rely on online product reviews as their primary source of information when considering a heater purchase.
- Participants tend to overlook product recalls unless they are specifically brought to their attention.

Recommendations and Suggestions

The recommendations listed below highlight the participants' focus on safety, usability, and effective communication in the design of heaters. These recommendations are based on multiple sources and consist of common themes mentioned by participants throughout the discussions in the sessions. Additionally, these recommendations have the highest coverage in the transcripts, indicating that they were repeatedly mentioned and considered significant by the participants. While the sample size is too small for full generalizability, focusing on the recommendations most frequently cited provides a strong foundation for heater considerations. These common themes expressed by participants suggest that addressing these aspects will cater to the needs and preferences of a larger population, ensuring widespread satisfaction.

- Participants emphasized the importance and preference for advanced safety features, such as auto shut-off functions and timers, this includes automatically shutting off when the heater reaches a certain temperature and when it tips over. This stems from the consistent mention and high coverage of these statements in the coded transcripts. (See Suggestions for Heaters section)
- Participants highlighted the value of built in thermostats and sensors capable of detecting potential overheating issues. (See Suggestions for Heaters section)
- Clear and non-technical instructions should be included to cause less frustration, especially for older adult populations who may struggle with complex technical language. This may involve using larger fonts, incorporating visual aids, or using plain language that avoids ambiguous terms or lengthy explanations. (See sections on Assessing Safety and Warning Messages and Suggestions on Heater Warning Messages)
- Participants recommend placing warning labels in bright colors on product manuals, packaging, and even on the third-party or primary manufacturer's website where applicable. This can help ensure that important safety information is easily noticed and understood. (See Suggestions for Heaters section)
- Participants also recommended that icon labelling (i.e., wavy lines, battery symbols) be consistent or followed by wording as some manufacturer's translations of the icons can be confusing. Icon labelling that is accompanied by concise and accurate wording helps

to ensure comprehension and avoid potential misunderstandings or misinterpretations of the safety instructions. This combination of clear symbols and supporting text can enhance the effectiveness of safety communication, regardless of language barriers or errors in translation of the symbols or icons. (See sections on Assessing Safety and Warning Messages and Suggestions on Heater Warning Messages)

- Another recommendation is to continue to emphasize warning messages that may appear to be “common sense” (e.g., flammable objects, extension cord or power strips, child, and pet safety). (see Suggestions on Heater Warning Messages)
- Participants also recommended that warning messages about power wattage and surge protectors be included to ensure no power outages. (See Suggestions on Heater Warning Messages)
- Participants also liked the option of having a remote control. This preference relates to accessibility as it provides convenience and ease of use for individuals who may have mobility or prefer controlling the heater from a distance. (See section on Unclear Warning statements)
- Participants voiced the need for longer power cords. This would reduce the need for and usage of power strips or extension cords. (See section on Suggestions on Heater Warning Messages)