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Perspectives of 30 English Patients on Call Light Technology, Eloquence™ Revisited

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Abstract

Call light technology is important because it serves as a direct link for patients to get their health care needs fulfilled by their health care providers. As primary users of call light technology, patient perspectives are important and warranted. Despite this fact, there is a lack of published literature regarding patient perspectives and call light technology. The present study examines a technologically advanced call light system (Eloquence) by incorporating thirty patient participant perspectives regarding its usefulness, effectiveness, appropriateness gathered from individual interviews. Utilizing qualitative descriptive research methods, five major themes and multiple minor themes emerged from the data.

Introduction

Call light technology serves as a means for communication for patients with their healthcare providers, and is a direct link to getting their health care needs met¹. There is a lack of published literature however, that specifically discusses how call lights affects patient care. Deitrick et al.² used ethnographic methods to and found that English speaking patients' comments revealed inconsistencies with response times, lengthy wait times for their call light to be answered, and lack of follow through with requests. Indeed, lengthy call responses and wait times for request fulfillment could result in safety issues and quality of patient care³. These patient perspectives are important because call lights not only a direct conduit to their care and to their health care providers; but also because this is one of the few ways in which patients can exercise control for their health care while hospitalized^{2,3}. One way to combat these patient concerns is to advance call light technology.

There has been increasing interest in improving call light technology to keep up with advances in health care technology and commercial communications technology³. Recent advances include the Vocera Communications System (California), which provides hands-free verbal communication^{4,5}. Healthcare staff evaluation of this device was favorable⁴, however; no patient perspectives were included in this device evaluation. As primary users of call light technology, patient perspectives are important. In parallel, more research is needed to address issues with call light technology and its relationship with patient satisfaction, quality of care, and patient safety outcomes. The purpose of this study was to solicit patient perspectives on the technologically advanced call light system Eloquence by examining its usefulness, effectiveness, and appropriateness in acute inpatient noncritical care units as perceived by patients in two adult care inpatient units in a large academic hospital in Michigan. Eloquence offers a plethora of technologically advanced features in call light systems (Table 1), some examples include: Touch screen device for patients (Figure 1); a nurse hand-held mobile device (Figure 2); an automated algorithm that assigns priorities of patient calls to the most appropriate health care personnel (i.e. registered nurse for medication request versus nurse tech for a request for water). In addition, Eloquence provides an automated acknowledgement response status of the patient request (Figure 3). At the time of this study, Eloquence was not implemented in any healthcare setting; but was nearing programming and logistical prototype completion. Patient perspectives and suggestions from a previous study¹ were incorporated into the advanced model of Eloquence used in this research study.

Previously, we interviewed focus groups of RNs and individual patient interviews utilizing qualitative methods¹ with regards to an earlier model of the advanced call light technology (Eloquence Communications, Ann Arbor, Michigan). The current model of Eloquence used in this research is more technologically advanced. As part of the parent study (*Advancing Patient Call Light Systems to Achieve Better Outcomes*, Small Business Technology Transfer Program of the National Institutes of Health (NIH) under award number R42MD006149), the interview guide included questions about patient perspectives regarding communication with the current call light device in use at the time of their hospitalization and its communication with their nurses (currently in review in a previous publication), and preceded the Eloquence demonstration data presented in this publication.

Methods

Qualitative data via semi-structured interviews was collected from thirty English speaking patients from two adult acute care inpatient units in a large academic medical center in Michigan. Approval from the institutional review board at the study site was obtained. Lists of potential patient participants was received by the units respective nurse managers and reviewed weekly by a trained graduate research assistant (GSA). After inclusion and exclusion criteria was reviewed (Table 2), potential participants were approached in their hospital room, a thorough explanation of the study was provided, and written informed consent was obtained. Potential participants were assured that their participation would not affect their care, and assured that collected data would be kept confidential and anonymous in publication. Written informed consent was obtained before any study procedures commenced. Interviews were conducted without the presence of nurses or other health care

providers by the same GSA. All interviews lasted approximately an hour. Each participant received a \$50.00 gift card for their participation and time. Qualitative data analysis utilized a descriptive approach^{6,7}.

To solicit patient participant perspectives regarding the advanced prototype of Eloquence Qualitative descriptive methods were utilized. A brief demonstration of the Eloquence capabilities provided the participants with an opportunity to simulate the device in the healthcare setting using various scenarios. Participants then were asked a variety of questions regarding the demonstration and were allotted time to ask questions regarding the device. Qualitative methods were used because these methods allow for a comprehensive view of the data, insures participant perspectives are known and appropriately represented, and that knowledge could be increased compared to what is currently known^{8,10}.

All interviews were audio recorded and transcribed verbatim. Transcribed interviews were analyzed using the constant comparative methods of Glaser and Strauss^{6,7}. To ensure appropriate and rigorous data analysis, members of the research team initially coded the data independently which were then compared; resulting in minor themes. Minor themes were then grouped into major themes⁸ and discussed until consensus was reached. In accordance with the seminal work of Guba and Lincoln⁹, strategies to establish trustworthiness (rigor in qualitative research) were utilized. Trustworthiness encompasses four necessary criteria: *credibility* (assurance that the research findings and interpretations represent participants' experiences), *transferability* (how widely the research and its findings might be utilized), *dependability* (how consistent and reliable the research is), and *confirmability* (to what extent the process and its findings can be linked to data and whether the researcher minimized bias and maintained neutrality, and through which the research and its finding can be tracked and confirmed). All criteria of trustworthiness for this qualitative study were met. Research team members responsible for data collection and analysis did not have financial interests in the development or marketing of the Eloquence call light system.

Results

A total of 30 patient participants were recruited and participated in this study (patient participant demographics are found in Table 3). Qualitative data analysis resulted in five major themes: Potential Beneficial Effects of Eloquence; Opposing Perspectives of Eloquence; Potential Impact of Health Care with Eloquence; Concerns with Eloquence Regarding Specific Patient Populations; and Eloquence Suggestions. Multiple minor themes emerged. These themes are described in the following sections.

Potential Beneficial Effects of Eloquence

Participants' initial reactions to the advanced call light system Eloquence were favorable and believed that Eloquence could be beneficial to their health care. Parallel to the previously published paper¹, participants found Eloquence to be user friendly (i.e. easy to read and operate), and found the device easier to communicate with their healthcare providers (i.e. ability to specify their needs, describe their issue clearly). Participants also discussed additional reasons why Eloquence would be beneficial: Technologically Advanced; Icon Appreciation; More Efficient, and that Eloquence could Assist the Nurses, Too.

Technologically Advanced

“It’s a direct communication. Even if you didn’t, this new one is going to be a tremendous step above this old one!”

“Because it’s just like an iPhone and I know how to use an iPhone...So, it’s kinda the same thing.”

“It’s very modern. Its 21st century...It reminds me of everything else that’s in my life like radio, my phone, T.V.”

“Well, it responds right back to you. The other one, the machine is just flashing...”

Participants appreciated Eloquence not only because it was technologically advanced over the current analog call light system currently in use, but also because its technology was familiar to them. The technologically advanced Eloquence also included appreciation for its logistics, namely its icons.

Icon Appreciation

“...When I saw the light bulb, I knew how to turn the lights on. So, having the pictures there is important.”

“...The pictures on it...Without even reading, I can tell what they are...I know this is for a nurse. I can tell which is bathroom, which is food, and which is comfort...”

“The big icons, the pictures. They are so self-explanatory...”

Easy to read icons not only contributed to the user friendliness of Eloquence, but also to the potential adaptability to the newly advanced system.

More Efficient

Participants stated that they thought that the Eloquence system would be more efficient than the current call light model in use, and provided specific examples. Participants stated:

“...You could say, ‘go find family member’...She knows what you want before she even comes down. She really don’t even have to come to your room. She can go find that family member and bring ‘em down without coming to your room. Quicker service.”

“...If she’s [nurse] out at the desk or in another room and you hit that [Eloquence], then they can communicate back with you. They can let you know they’ll be right there. I think it would be more efficient...”

“...I mean it won’t be a long drawn process. You know, whatever the problem is...”

Participants also stated that they thought that Eloquence could also provide better efficiency for their nursing too.

Assist the Nurses, Too

“They [nurses] would understand the need before they got here. They would have a heads up. When we call them and they come in here, they have no idea what I need at that point.”

“It’ll make it easier probably [for nurses]...They won’t have to quit what they’re doing, come see what you want, and then go get it. If they’re with another patient somewhere else, they can say, “Sure I’ll check on that for you’...I think it would be more efficient.”

“I just think it would make it easier on both the staff and the patients. As far as cutting the response time because they would know what you need.”

Efficiency proved an important concept for participants, not only to get their requests and needs fulfilled; but also for the nurses and healthcare providers as they could also conserve effort by being more efficient. Parallel to the importance of efficiency, participants discussed the potential impact that Eloquence could have on their healthcare if implemented.

Potential Impact of Health Care with Eloquence

Participants commented that Eloquence could “streamline care.” By streamlining, participants believed that nurses and other healthcare providers could not only prioritize their call light requests, but also prioritize patient care.

Streamline Care

“Oh, it would streamline things a lot better. If you [nurse] got 2 calls for the same thing right next to each other, the nurse can grab 2 new pillows. It will prioritize things better for the nurse before so they just don’t have calls. They can say, “Well, Mr. Jones needs help more and faster than Mr. Smith does.”

“...They [nurses; healthcare providers] would have an idea of what I needed compared to the person that might be 2 doors down from me that’s also their patient. And if they’re in dire need, I think their needs should come before mine even though my call reached first. I think it’s very wise to get the patients who need more assistance to begin with instead of those who just need their pillow fluffed.”

“[Eloquence] is more quicker. With this old one, you push it, they come down, ask you what’s wrong, and you tell them you need medication. [With Eloquence] They already know what kind of medication you take. With the new one, you push “pain meds” and they can pretty much have it stat instead of coming in and having to leave back out...It just saves time. Faster can never be a bad thing. You can never have a problem with someone being faster than they is.”

Streamlining care led to an advanced conversation regarding the clarification of patient call light priorities, and how Eloquence could assist with this clarification.

Clarification of Patient Priorities

“...The other night, I was freezing and all I really needed was a blanket. So, if I could’ve just pushed “questions” or “need assistance” that would have made it a lot easier than putting on my call light and waiting. That way they could even bring what they needed...”

“...It [Eloquence] would get them [my needs] met quicker, because you would be specific. Brushing my hair or teeth, this is something I could do myself and I want to do that. That’s a whole lot different that IVs, so it just prioritizes.”

“...I think it [Eloquence] would be quicker because I wouldn’t be wasting a nurse’s time when it was only an aide that I needed. Right now, when you push the button, you get either aide or a nurse...”

Participants then, believed that Eloquence could not only streamline their care because their healthcare providers could prioritize the needs of their patients; but also because Eloquence could provide clarity as to how and why the call lights are answered in the order in which the calls are answered due to the specificity of the requests.

Participants also discussed potential concerns with the implementation of the Eloquence system. Specifically, participants discussed specific patient populations; including the Elderly, and Specific Patients’ Diagnosis.

Concerns with Eloquence Regarding Specific Patient Populations

The Elderly

‘I thought it was easy, but for older people or people who aren’t as computer savvy, it might not be.’

“...I’m more worried that elderly people would have a harder time with it because my dad can’t even use his smartphone.”

“...I feel that old people wouldn’t be able to do this. My grandma would not even try.”

“...The 80-year-old probably couldn’t use it because they’ve never gotten on a computer before. They don’t even use ATMs.”

Participants expressed concern not for the Eloquence device itself, but for the inability of the elder population to utilize Eloquence due to its advanced technology. Eloquences’ advanced technology also led to another concern; patients with specific diagnosis and their ability to use Eloquence.

Specific Patients’ Diagnosis

“Sometimes the neuropathy with the diabetic patients’ causes numbness and makes it harder to push...I think they could make the remote control with a softer touch button...”

“...My fingers are numb so it’s kinda feel to the touch. In the last year or so it has been because it got worse and worse as my heart condition got worse.”

“...I got a concussion and I haven’t gotten my reading things [i.e. glasses] back.”

As a user group in call light technology, patient perspectives are relevant, and special patient populations are no exception. Participants did express opposing concerns regarding Eloquence. These concerns led to relevant suggestions for potential improvement.

Opposing Perspectives of Eloquence

Size

“You could make the icons a little smaller and have the same size screen or you could have more screens like you have apps on your phone.”

“You don’t want it too big because then it’s gonna be in the way. But, I think that each individual picture could be a little bit bigger so you can see them. At night, if you tap it, it probably just totally lights up...”

“Well, if you’re using this type of mechanism...Maybe you could make it bigger... At night it would be a little easier to see.”

“Well, they make bigger tablets...That would allow you to be able to put more buttons...”

“...Maybe make it a little wider...Or it could be pulsating to let you know there’s something going on up there; draw your eye to it.”

The size of the call light device proved to be important, especially how size relates to the display (i.e. light) and the handling off the device.

Technological Issues/Concerns

“If the network goes down, just technological issues. When it rains, we lose the T.V. ”

“How much memory do you want to put in it?”

“I didn’t happen to notice if there was a backup feature...”

Potential technological issues showed participants’ understanding of advanced technology and the importance of basic concepts of networks (i.e. back-up and memory). Participant acknowledgment from the call light also created concern.

Patient Acknowledgement Concerns

“It’s just a button on the other end. They don’t actually have to talk to you. They might forget...”

“...It says ‘they’re on their way’ and they actually show up, that would be different. Because they’re proving that, when you press the button, they actually come in...”

“If it’s delayed a long time, you would maybe question if it is working or not. You would wonder if they’re really coming or not...”

Even though Eloquence utilizes a digital response mechanism, participants expressed concern for a physical (i.e. nurses) response as to when the call light was answered (and thus, when their request was addressed). These concerns further illustrate the understanding of technology by the participants.

Location

“Kinda like they mounted that television, strong and true and able to come out at any angle...”

“Have a really good mounting system and a really good bracket that doesn’t come out. The arm will have to be long enough to work and be practical. It has to be accessible.”

“...You could put it on a post and pivot it both ways. When I get out of bed, I could pull it to me and it would be here. Then, we you go to bed, you can push it to the bed...”

Location was important to participants because they associated it directly to the accessibility of the call light.

Eloquence Suggestions

Participants were clear about future Eloquence design and logistics, namely the addition of texting, emergency features, color coding, “words” on options, adding a nurse tech option, and the warrant for detailed directions for the usage of the device.

Texting for Direct Communication

“...The old one can’t tell them to go get a family member. It just gets ‘em to come. It would be cool if you could text it...”

“Free text both ways. The text message could go both ways. The nurse could text you back.”

“...Free text maybe. You can type in whatever you want... [ALLOWS ME] To be specific about what I want.”

Participants were clear when they stated that adding a texting function would not only be beneficial for both themselves and for nurses, but also more efficient as well.

Add Emergency Feature(s)

“An emergency feature would be something to consider...”

“...Maybe if the call light had a speed dial for an emergency. The cord is way back there. I can’t move. I just think it could be a better extension of what is exactly is going on in your room...”

You know, just something like if all of a sudden you don’t feel well. You don’t want to sit here and go through all these buttons. Say I started choking I would need some way to tell somebody right away. I need something that says ‘I need help now...’

The addition of an emergency option meant that awareness and acknowledgement of the issue (i.e. emergency) would create awareness and therefore, hopefully addressed expeditiously.

Color-Code Eloquence

“...The only thing I could see is possibly as an improvement would be a color code system instead of it just being monochromatic...I would go with red for pain versus blue for comfort.”

“...Let’s say it had different colors. Like, one color if it [request] was already taken care of...”

“I would probably make it yellow or something that kinda stands out a little [COLOR CODED BUTTONS]. It doesn’t really pop out to me.”

Color-coding Eloquence meant the device would be easier for participants (i.e. patients) to decipher the intentions (i.e. pain, comfort) of the device.

Write “Words” on Options

“You could write the word nurse on it. Yes. I think that looks a little bit like an ambulance driver. It looks the way nurses used to look.”

“...I think “go back” or “go to the previous screen” or “go back to the main menu” or maybe write the words “main menu” on that...”

“...I would change the language button to actually say “language” on it...”

Writing actual words on the options would provide clarification of the intent(s) of each option (i.e. button) in Eloquence.

Add Nurse Tech Option

“...Sometimes the tech will come in and say, “Hey, can I help you with something?” If it was an emergency and you had 2 buttons, you would prefer a nurse that really knew what they were doing compared to a tech...”

“I think having a tech button...Just to let the nurses do their jobs so they’re not running from room to room and the next. That way they can actually do their rounding...”

“...Every time the tech comes, she says, “You need to ask your nurse about that.” So, it’s kinda like silly for the tech to come. It’s almost like there needs to be a second button. Like, if I just needed a juice or something, I could just call the tech...”

The addition of a nurse tech option in Eloquence served as a way to clarify their care (i.e. nurse for emergencies); and to get their needs met by the correct healthcare personnel (i.e. juice from the nurse tech).

Directions Warranted

“Yes, it could, once understood and taught.”

“...Are very necessary [call light instructions]...Just how to use the volume, the light, etc...”

“I think it should be early [EDUCATION ON CALL LIGHT DEVICE] on since it has to do with emergency things.”

“...I don’t think they would have a problem once you showed ‘em. It would take 15 or 20 minutes for somebody to show ‘em...”

By suggesting directions for the call light and its use, participants depicted their investment in their health care and their desire to understand the call light device because they understood the importance of the call light and its direct link (i.e. conduit) to their care.

Discussion

Findings from the participant (i.e. patient) perspectives revealed that the technologically advanced call light system Eloquence was favorable and beneficial for participants. Parallel to the previous study with a much earlier design of the Eloquence model, participants appreciated the usability, and found the device more appropriate to communicate with their healthcare providers. However, with the advanced model; participants found additional reasons why this was so. Often referring to the advanced technology, participants understood its logistics (i.e. icons), and discussed suggestions on how to further advance Eloquence by increasing its technological capacities (i.e. adding a texting option, using “words” with icons, and color-coding the system). These suggestions infer that participants are interested in call light technology and how it impacts their care while hospitalized. To further strengthen this finding, participants’ perspectives included the belief that Eloquence could assist with streamlining their care (i.e. prioritize their needs and care), and in turn; this led to a clarification of how patient priorities are and could be answered by health care providers (i.e. specificity of requests “...would get them [my needs] met quicker...”). Participants discussed further that Eloquence would be beneficial for the nursing staff as well; as nurses would already know their needs before coming to the room and thereby conserving energy, and that direct verbal communication via Eloquence would provide acknowledgement for participants, and therefore; improve efficiency because requests could get fulfilled quicker. Participants also discussed concern for specific users of Eloquence, and some opposing views of Eloquence after its implementation.

Participants were concerned with the elderly and patients diagnosed with specific medical conditions with regards to their ability to operate Eloquence. For example, participants commented that some elderly are not technologically savvy, and therefore, Eloquence may be difficult to utilize. Likewise, patients with specific diagnosis (i.e. diabetes, neuropathy, concussion) may find Eloquence difficult to operate. In addition, participants stated other concerns with Eloquence including its location (mounting location and accessibility), technological concerns (network stability, amount of memory, and backup features), acknowledgement and fulfillment of their requests (verbal verses physical presence of nurses). Patient participants, as primary users of call lights; provide important perspectives not only for call light technology; but also shed light on how the call light impacts their care. Therefore, patient perspectives are not only needed; but warranted.

Study Implications

Call light systems serve as direct conduits of care between patients and their health care providers (i.e. nurses). Indeed, the importance of implementing a multifunctional call light system that addresses the needs of both patients and health care providers, cannot be understated¹. The present study contributes to further ideas of the importance of patient communication, patient communication with their caregivers, and how call light technology impacts this communication. As this study took place in a real-patient care setting, it advances contribution to current published literature (albeit limited). Specifically, patient perspectives regarding call lights and its direct link to their health care. Further research is strongly recommended to better understand patient perspectives and the impact of the call light, its technology, and its communicative properties between patients and nurses (or other healthcare providers). Some suggestions for further research could include Eloquence in private healthcare settings, or comparison research between public and private healthcare call light technology and its impact on patient outcomes. This study could also be replicated as a multi-site study representing different geographic regions and cultures of the country.

Acknowledgments

We acknowledge that this study was conducted at a single study site; and therefore; may be viewed as a study limitation. Although findings may not be generalizable beyond the current setting, we do acknowledge the value of replicating this study at multiple sites, since patient perceptions regarding their health care and their communication with their health care providers is important.

In summation, findings from these patient perspectives favor Eloquence as a viable, technologically advanced, and favorable call light system; that could meet the needs of patients.

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Figure 1.
Eloquence bedside patient device. Reproduced with permission.

Figure 2.
Eloquence mobile display for nurses. Reproduced with permission.

Figure 3.
Eloquence patient response acknowledgement. Reproduced with permission.

Table 1

2016 Advanced Features of Eloquence™

Eloquence™ 2016 Advanced Features	
•	Patient requests automated and routed to providers based on skill level and urgency
•	Smart routing reduces non-productive hours for nursing staff
•	Delivers first-time access to nurse call communications for patients with limited English proficiency
•	Patient requests immediately translated to provider devices
•	Transparency of patient requests in provider device reduces number of trips made to patient room
•	One touch access provides immediate efficient and easy access to interpreter services
•	Alert management algorithm across 30 patient requests achieves the safest, most efficient and highest quality nursing workflow possible
•	Maintaining an active state of call request until fulfilled guarantees fulfillment and better quality care
•	Routing, response and fulfillment metrics across 30 patient requests delivers unprecedented transparency where patient care is making a positive and negative impact on outcomes
•	New metrics deliver precise guidance on how to best utilize staffing resources and reduce non-productive time
•	New metrics provide just-in-time, care specific guidance on best practices with nursing staff allocation
•	New metrics deliver performance improvement opportunities across all individual care providers, provider types, and each nursing care units
•	Professional Services Automation feature guarantees timed care processes that are tied to outcomes are executed 100% of the time and on time (e.g., pain assessments every 2 hours, ambulation every 4 hours)

Table 2

Participant Inclusion and Exclusion Criteria

Participant Group	Inclusion Criteria	Exclusion Criteria
Patients (n=30)	1 Proficient in English	1 < 21 years of age
	2 Hospitalized for at least one night	2 Officially discharged
	3 21 years of age or older	3 Hearing deficits
	4 Ability to speak (e.g. not intubated or trached)	4 Cognitive impairment
		5 Infectious disease

Table 3

Patient Participant Demographics (n=30)

Characteristic	n	%
Age		
21 years and < 35 years	4	13
35 years and < 45 years	5	17
45 years and < 55 years	9	30
55 years and < 65 years	5	17
65 years and < 75 years	5	17
75 years and < 85 years	1	3
85 years	1	3
Sex		
Female	13	43
Male	17	57
Ethnicity		
Caucasian/Non-Hispanic	24	80
African-American	5	17
American Indian/Alaskan Native	1	3