

# Women's Perceptions on the Use of Video Technology in Early Labor: Being Able to See

CEU

Mary Ann Faucher<sup>1</sup>, CNM, PhD, MPH , Holly Powell Kennedy<sup>2</sup>, CNM, PhD

**Introduction:** Delaying admission to the birth setting until active labor has commenced has known benefits. However, women and their partners often struggle to stay home in early labor. Research on telephone triage during early labor at home has illuminated significant disadvantages with this model of care, contributing to women feeling dissatisfied with the early birth experience. Research conducted with midwives on the potential benefits of using video technology suggests it might be a helpful strategy for early labor support. This study examined women's perspectives on the potential use of this technology.

**Methods:** Focus groups and individual interviews were conducted with 23 English-speaking women who experienced spontaneous labor within the last year. The recordings were transcribed verbatim. Content analysis was used to interpret women's perceptions.

**Results:** The women identified potential advantages of video technology in early labor connected to the major theme of being able to see, which could enable closer human connections between the intrapartum care provider, the woman, and her partner, as well as better assessments of labor. This human connection was integral to enhancing empathy and building confidence. Concerns about using video calls during early labor at home focused on privacy issues and the need to practice beforehand. Concerns about privacy depended upon having a prior relationship with the intrapartum care provider and women being able to decide if they wanted to use the technology.

**Discussion:** One way of optimizing the experience of staying home in early labor and overall satisfaction with the birth experience may be with video technology, which could offer enhancements over traditional telephone triage.

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## INTRODUCTION

Early labor care is one aspect of assisting women to achieve a vaginal birth.<sup>1</sup> Women who are admitted to the hospital in active labor are more likely to progress without medical intervention.<sup>2</sup> Delayed hospital admission is also associated with a decrease in primary cesarean birth<sup>1</sup> and shortens the length of stay for women giving birth, which can result in significant cost savings.<sup>3</sup> It is common for women experiencing onset of labor at home to telephone their health care provider to seek advice or confirmation labor has started and information about when they should travel to the birth setting. Prior research suggests that women are dissatisfied with telephone triage for early labor assessment, reflecting unmet needs for support and advice.<sup>4</sup> Some noted their concerns were not heard and felt a lack of empathy from the intrapartum care provider.<sup>5</sup> Advice on pain management strategies is important to women laboring at home,<sup>6</sup> yet research examining midwives' views of telephone triage revealed omission of coping strategies as part of the discussion.<sup>7,8</sup>

Early labor can be a time of uncertainty for many women.<sup>9,10</sup> Recommendations from the intrapartum care

provider to stay home in early labor may be in conflict with women's desires.<sup>7,11</sup> Women relate a struggle in negotiating timing for admission in labor with their health care provider, in which how they feel and the advice they receive can be at odds.<sup>6</sup> Women are known to vacillate about wanting to stay home versus being in the presence of care providers.<sup>9,10</sup> Lack of confidence is another common struggle, possibly indicating greater need for decisional support in early labor.<sup>9</sup> Women who present to the birth setting thinking they are in labor and are subsequently sent home can feel embarrassed and vulnerable,<sup>4</sup> in addition to being dissatisfied.<sup>6</sup>

With recent evidence suggesting that active labor may not commence until 6 cm of cervical dilatation,<sup>12</sup> the amount of time women spend at home in early labor may likely be prolonged. Accurately assessing when active labor starts is challenging because of the retrospective nature of this insight. However, alternative means of communication in which visual cues could be observed by both women and intrapartum care providers hold the potential to improve assessment, diminish false alarm visits to birth settings, and offer greater support.

Improved assessment through visual cues was cited by midwives as a perceived benefit enabled with video calls.<sup>13</sup> Midwives considered using video calls in early labor as a potential enhancement for providing more assurance to women and families in the home environment. As a follow-up to and extension of this research, we aimed to explore the views of postpartum women on potential benefits and concerns about the use of video calls in early labor to expand our insight and understanding and to lay the foundation for an intervention study.

<sup>1</sup>Louise Herrington School of Nursing, Baylor University, Dallas, Texas

<sup>2</sup>School of Nursing, Yale University, New Haven, Connecticut

### Correspondence

Mary Ann Faucher  
Email: mafauch@yahoo.com

### ORCID

Mary Ann Faucher  <https://orcid.org/0000-0002-8353-3077>



## Quick Points

- ◆ Women perceive being able to see an intrapartum care provider through video calls in early labor could enable improved labor assessment.
- ◆ Video calls have the potential to enhance the human connection between the intrapartum care provider, the woman, and her partner, which may foster empathy and support and boost confidence to stay home in early labor.
- ◆ Privacy concerns about video calls depend upon knowing the intrapartum care provider and the women's autonomy to decide to use the technology.
- ◆ The need to practice video calls before initiation during early labor is a strong recommendation from women.

### METHODS

The conceptual framework for this study was informed by the American College of Nurse-Midwives' Hallmarks of Midwifery as outlined in the *Core Competencies for Basic Midwifery Practice*.<sup>14</sup> Two hallmarks are especially relevant to this study: "advocacy of non-intervention in normal processes in the absence of complications" and "empowerment of women as partners in health care."<sup>14(p 2)</sup>

We conducted a qualitative study using focus groups and individual interviews to examine postpartum women's perceived advantages and concerns about using video calls for assessment of early labor at home. A convenience sample of women was recruited using informational flyers at 2 clinical locations in Connecticut and Texas, near areas where the researchers reside and work. Inclusion criteria included English-speaking women who experienced spontaneous labor within the last year. Exclusion criteria were women with labor inductions or scheduled cesarean births. Informational flyers were also posted at sites where postpartum care or breastfeeding classes were provided. Health care providers and staff at these sites assisted with targeted recruitment. The study was determined as exempt by the Baylor University Institutional Review Board.

Two researchers experienced in qualitative research facilitated the focus groups and interviews were conducted from May 2018 through April 2019. A research assistant recorded field notes during the group sessions. Semistructured questions (Table 1) were used to facilitate focus group discussions with individual interviews added when participants were not available during the focus group times. Focus groups are ideal for exploring a social phenomenon and to illuminate a greater depth of understanding and interpretations about that experience through group dialogue.<sup>15</sup> Triangulation of data collection methods using both focus groups and interviews can also help strengthen the research.<sup>16</sup> The focus groups and interviews lasted between 45 and 90 minutes and were audio-recorded and deidentified. Field notes were written to describe the settings and participants in the interviews and focus groups, such as when all members of the group nodded their heads affirming the discussion point. Women were offered a small monetary gift card for their participation. Inquiry was completed at data saturation when the final focus group added no new findings.

We used content analysis<sup>15</sup> to examine verbatim transcripts for meaningful text and managed the data using

ATLAS.ti, a qualitative software program. Codes were developed by both researchers by comparing the first 2 transcripts. Analytic memos were used to identify unanimous or disparate agreement within and between focus groups and interview sessions. These memos were also used to facilitate analytic discussions between the researchers to achieve consensus about coding, categorization, and thematic identification. These memos provided an audit trail and added to the transparency of the analysis. The researchers also conducted an interaction analysis to compare the transcripts to ensure themes represented group rather than individual perspectives, supporting the trustworthiness of the results.<sup>16</sup> This process is important for moving the analysis past documentation of individual experiences to identification of unique and meaningful group insights about early labor and use of video calls.<sup>16,17</sup>

### RESULTS

Twenty-three postpartum women participated across 4 focus groups and 2 individual interviews conducted between the 2 study sites (Table 2). All participants were comfortable with video technology on their phones or computers and intrigued by the idea of using it in early labor. They discussed what they perceived could be advantages and what the concerns might be in using video technology in early labor. Table 3 provides an overview of themes and categories specific to perceived advantages and concerns. Figure 1 presents the connection of advantages in a network constructed by the researchers using analytic functions within the qualitative software. Perceptions on the use of video calls centered around the participants' personal experiences of labor, interactions with health care providers in labor, and how those might change with video technology.

#### Advantages of Video Calls for Early Labor Care: Being Able to See

Being able to see was expressed as a compelling benefit because video calls provided another sense that offered a better gauge for assessment of coping with labor and connecting with the woman and family. Seeing a woman's reaction to pain and allowing the intrapartum care provider to actually time contractions enabled through video calls was described as being more informative for an assessment of labor, in contrast to asking if they can talk through the pains, which they described as a typical question asked during phone calls.

<b>Table 1. Focus Group and Interview Questionnaire</b>
<b>Semistructured Questions</b>
Can you tell us about whether you use video calling in your personal or professional lives currently?
Are you confident users of information technology more generally?
How do you feel about using video calling? Prompts: Skype, Facetime; in personal or work life; confident users.
Do you think video calling has any potential benefits to offer in early labor care? Prompts: benefits for women, birth supporters, midwives, services?
Would you have any concerns about using video calling in early labor care? Prompts: technology, environment, ethical and legal issues, training needs.
How should we assess the success (or failure) of video calls in early labor?
What outcomes should we measure in future research?
How would you feel about being part of a study that implemented video calling in early labor care and evaluated it?
What would make it likely that you would participate?
Is there anything else you would like to share with us?

<b>Table 2. Participant Demographics (N = 23)</b>	
Characteristic	n (%)
<b>Age range, y</b>	19-40
19-24	1 (5.5)
25-30	7 (30.4)
31-35	11 (47.8)
36-40	4 (17.3)
<b>Mode of birth</b>	
Vaginal	19 (82.6)
Cesarean	4 (17.3)
<b>Birth attendant type</b>	
Midwife	17 (73.9)
Physician	6 (26.1)
<b>Place of birth</b>	
Hospital	23 (100)

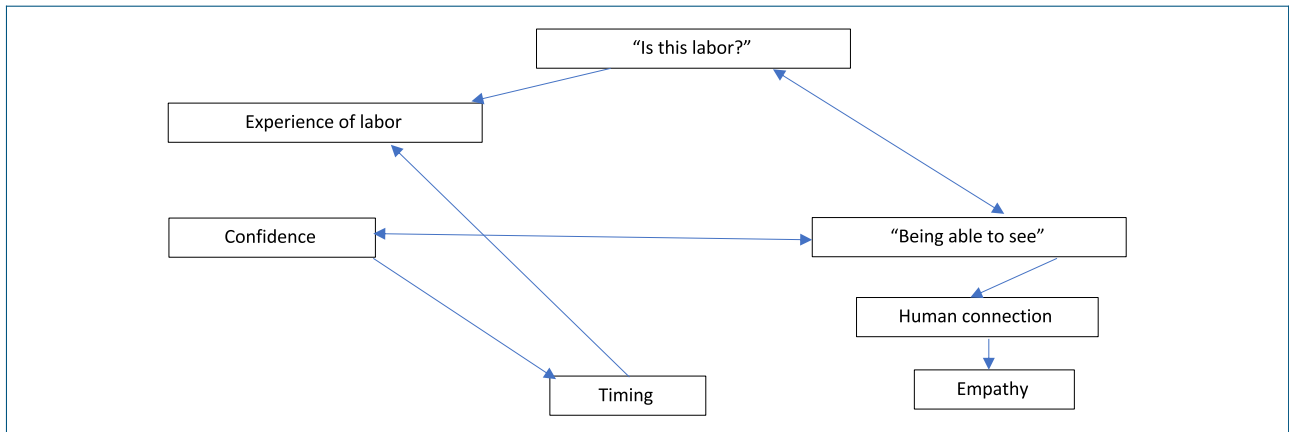
*So, I think in that moment, you know, I had one, [the contraction] ... and pretty intense, but seeing them, having them watch me, instead of just, kind of, making out how I'm breathing over the phone, would have been assuring, and maybe more helpful for them to know how it's progressing.*

Enabling better assessments derived by being able to see was also associated with reduced uncertainty about what is actually labor. Participants thought this would improve their confidence for staying home in early labor in terms by knowing this is labor and knowing what to expect.

*I mean I was so confused, like is this it? Is this just Braxton Hicks? And people would ask me things like, well how bad are the contractions? And I was like well, I don't know, because I've never done this before ... so I think it would have been really helpful to have that [video call].*

Human connection was also identified as an advantage and closely related to being able to see. Participants shared unanimous perceptions that video calls would generate a connection between the intrapartum care provider and the woman, often expressed in terms associated with empathy and reassurance. Human connection was perceived to lessen fear and anxiety for the woman and her partner. Feeling more support and reassurance from the intrapartum care provider on a video call was communicated by women as an essential aspect of feeling confident to remain at home during the early labor experience. These benefits were contrasted with telephone triage.

<b>Table 3. Thematic Interpretation of Perceived Advantages and Concerns About Video Technology in Early Labor Care</b>	
Perceived Advantages of Video Calling in Early Labor	Concerns About Video Calling in Early Labor
<b>Being able to see</b>	<b>The privacy thing</b>
Better assessments	Do I know you?
Knowing this is labor	Let me decide
Knowing it's time to leave home	<b>Let's prepare beforehand</b>
<b>Human connection</b>	Avoid stress from technology
Increased empathy	Intrapartum care provider's nonverbal behavior
Confidence for staying home	
<b>Some women may benefit more</b>	



**Figure 1.** An Analytic Network Showing Perceived Advantages of Video Calls in Early Labor

*I was really struggling to manage the early labor. I had, I was throwing up, I felt like I was hyperventilating ... I think if I had had a Face Time talk with somebody like looking me in the eyeballs and saying, "You got this. Take a deep breath." And walked me right through it, I wouldn't have had to make two trips to [the birth setting].*

The participants thought that the human connection would enhance their confidence of knowing if this is labor and would help with knowing when to stay versus leave for the birth setting. They shared their worry about getting to the hospital too soon and being sent home. The ability to see and the human connection enabled with video calls was perceived as having potential to resolve the uncertainty surrounding timing of arrival at the birth setting.

*I think I sounded like I had a lot more time than I did. And luckily my husband noticed that ... whereas if someone had seen my face and like my movements and how I was dealing with that contraction I was going through; yeah, it looks like not just your face, but your body language. Cause maybe the tone in your voice is ok and you're not really ... I think it's really hard for the midwife to say, "Yes you should come in or not, based on just what you sound like."*

The participants identified an additional advantage was that some women may benefit more from video calls than others. Priority populations were women having their first birth or women without a partner for labor support.

*It might help bring down some nerves particularly for first-time mothers ... just having that visual of seeing someone might be reassuring if nothing else, just seeing their face being very calm and saying, "no, no, this is normal" ...*

### Concerns About Video Calls: The Privacy Thing

When queried about challenges or disadvantages of using video calls in early labor at home, their first response was about the privacy thing. Not all thought they would be comfortable with being seen on a video call.

*Yeah, I think privacy would be my biggest concern ... I almost wanna say anonymous, when you call and you don't*

*have to see somebody. I think I would be more comfortable just on a phone than Face Time ...*

Privacy concerns also depended on potential feelings of embarrassment if women were partially undressed or receiving calls without prior notification. This concern depended upon whether the woman had an established relationship with the intrapartum care provider on the video call described as, "do I know you?" They thought having the woman or the partner decide to initiate or give permission for the call could ameliorate these concerns: "yeah, like if I'm ready to see them, I call, I hit Face Time ..."

*So intellectually I think it might be challenging if there was an intimate something that we would need to converse with via Facetime or what have you. I mean, I'm not concerned with the phone call being hacked and all of a sudden, my genitals being online or something silly like that ... I don't have a concern with that necessarily. But I think if you already had a relationship with the midwife you were working with, that level of comfortability and privacy would have hopefully already been there.*

Participants also expressed concerns about hardware, software, and connectivity challenges and recommended preparing beforehand. Having problems with technology were viewed as taking away the benefits of human connection with video calls by adding stress during a time when women felt all their focus needed to be concentrated on managing the early labor experience. This avoidance of stress was connected to participants recommending having at least one practice session beforehand, for example, during a prenatal visit.

*I kind of worry about the signal. Like maybe the hospital would have a dependable set up of their video chat. But like, it would stress me out if I'm trying to talk and the connection was bad ... if I'm coming in and out because my phone is having an issue then that would frustrate me.*

Participants wanted to know who would initiate the video call, what number or phone to use for the call, and would the intrapartum care provider take a call if it was on her or his personal phone. Having written instructions detailing the procedure for placing the video call was another suggestion. Participants stressed the need for the intrapartum care

provider on the video call to be attentive and aware of their own body language and composure. This concern, linked with practice beforehand, suggests the need for intrapartum care provider training.

*... just the fact that you're talking to someone with your face is tricky. So yeah, kind of getting used to it ahead of time so in the moment when you have so many other things to stress about that's not one of them.*

## DISCUSSION

Our findings further highlight the need for improved processes of care for women and their partners while at home in early labor. Participants put strong emphasis on being able to see each other (intrapartum care provider and woman) as a pivotal advantage facilitating a human connection that enhances feeling greater empathy from the provider and confidence for staying home in early labor. This heightened sense of caring through video calls reinforces other literature showing benefits and satisfaction associated with childbirth when a human connection exists between the provider and the woman.<sup>18-21</sup> In contrast, telephone triage is linked with women feeling a lack of empathy and dissatisfaction communicating with the provider.<sup>4,8</sup>

Participants expressed that being able to see with video calls could improve timing for travel to the birth setting and reduce uncertainty about knowing if they are in labor. Knowing that true labor has commenced and appropriate timing for travel to the birth setting are key components of satisfaction with the early labor experience.<sup>22,23</sup> Improving labor assessments with video calls compared with telephone triage was perceived to reduce ambiguity between intrapartum care provider advice and the woman's experience in early labor. Our participants also voiced that these advantages would facilitate women feeling more confident and less uncertain about staying home. Feeling uncertain is indicative of gaps in knowledge that interfere with developing confidence, self-efficacy, and decision-making abilities.<sup>23</sup> Confidence related to labor has been associated with the attribute of knowing, either derived knowledge or experiential.<sup>24</sup>

Self-efficacy, an attribute that instills women with confidence to maintain power, including autonomy and decision making during early labor<sup>23,25,26</sup> is also facilitated through gaining knowledge and understanding, skills development, specifically self-regulation, and social support.<sup>27</sup> Having self-efficacy improves capacity to cope through a reduced stress response<sup>27</sup> and decreased perception of pain, fear, and anxiety.<sup>28</sup> The enhanced human connection perceived with video calls was interpreted by our participants as having critical value for developing human agency during early labor. Coughlin and Jung describe agency as a function of being able to make an informed decision on one's behalf independent of or in collaboration with the health care provider.<sup>29</sup> Feeling listened to and comfortable discussing concerns with a provider<sup>20</sup> and having personal choices respected<sup>29</sup> are the human connection aspects that facilitate agency. Importantly, women desire having information over the course of pregnancy to enhance their decision making with a trusted health care provider.<sup>30</sup> Thus, an unrealized benefit of video calls

may be in establishing a visual conduit between women and provider that contributes to improved confidence and self-efficacy and thus empowers human agency.

Not having experienced a prior birth or being unpartnered were identified as attributes of pregnant women who may benefit more from enhanced human connection facilitated with video calls. This opinion was associated with concerns that these women have more overall uncertainty about the early labor. Knowledge derived from having a previous labor and birth was described as advantageous for achieving delayed admission, as was having a midwife or doula and self-directed childbirth education or formalized attendance at community childbirth classes. Experiential knowing, gained from having a previous birth, promotes desire for decisional control during birth.<sup>31</sup> Women having their first birth demonstrated lower desire for control<sup>31</sup> and lower self-efficacy<sup>32</sup> when compared with multiparous women. However, women having their first birth also describe feeling empowerment resulting from being able to stay home in early labor, which translated to making informed choices during the birth process.<sup>23</sup>

We found some concordance in our findings with a similar study with midwives regarding video calls in early labor.<sup>13</sup> Both results reflected that being able to see with video calls enhances potential for establishing a productive human connection. Although our participants added preference for having a video call with an intrapartum care provider with whom they already had an established relationship, midwives perceived the initial video as the trigger for relationship building in early labor care.<sup>13</sup> Midwife perspectives on video calls not voiced by our participants include concerns for disparity in access to video calls in non-English-speaking women, issues concerning privacy protection, and time and cost savings benefits specific to avoidance of triage visits.<sup>13</sup> The need to practice video calls and apprehension about connectivity issues with technology were shared concerns articulated by our participants and midwives.<sup>13</sup>

Clinical implications for widespread uptake of video calls in early labor support a philosophy around the normality of birth, including spontaneous labor.<sup>23</sup> Supportive and shared interaction between the woman and the intrapartum care provider in early labor and communication throughout pregnancy unencumbered by biased risk discourse<sup>33</sup> are prerequisites to feelings safe and confident in the realm of early labor in the home environment. Whether women will develop self-efficacy for birth solely with video calls in early labor is unknown; video calls may be insufficient. For example, lower self-efficacy and decisional control are linked with inadequate preparation for birth, suggesting prenatal interventions are important.<sup>34</sup> Community-based childbirth classes have also been associated with improvements in self-efficacy among women having their first birth<sup>26,35</sup> and lowered perceived anxiety and pain in early labor.<sup>26</sup> Additionally, enabling self-efficacy and autonomous decision making may depend on the manner in which knowledge is imparted by the health care provider and women's own risk tolerance,<sup>22,36</sup> which was alluded to when participants emphasized the importance of the nonverbal communication of the provider with the woman when on video. More research is merited to evaluate the impact of changes in how telephone triage is conducted and the



influence of early labor lounges on childbirth outcomes, along with trials evaluating video calls for early labor care. Modifications to telephone triage have been suggested that could result in some similar advantages of video calls in early labor. Deemphasizing contraction timing rules and more emphasis in the conversation that is reassuring and reinforces the reasons for staying home in labor are recommended improvements to telephone triage.<sup>8</sup> Practice implications include allowing women to choose the between the option of video calls or telephone triage for assessment of early labor in the home.

Cost considerations, although not addressed by participants in our study, are relevant to practice. Video calls may require encryption of current systems to comply with health information privacy laws. Time is expensive, and training for optimal use of the technology entail costs for women, families, and intrapartum care providers before implementation of video calls. However, a potential offset to these costs is saving from avoidance of cesarean birth and delaying hospital admission, which has an estimated cost savings in the United States of \$694 million annually.<sup>3</sup>

## CONCLUSION

We acknowledge limitations to our study that affect the transferability of these findings. All participants experienced a hospital birth. However, because hospital births are associated with more interventions when women present early to the birth setting,<sup>3</sup> it is reasonable to assume women choosing hospital births are likely to benefit more from video calls in early labor than women choosing a community setting for birth. We also did not formally collect data to determine the mix of parous versus multiparous women, although both were represented in the sample. Thus, the benefits of video calls may vary based on parity, including the previous birth experience and intrapartum care provider type. Our sample lacked diversity in age because most of the women were in their 30s, and we also did not collect information about the racial or ethnic diversity of our participants. The perspectives of women attended by physicians may also be muted in our findings because the majority of participants were associated with midwives, although clients enrolled in midwifery care were not targeted for recruitment. Importantly, comments by participants suggested that midwives may educate women more about early labor including both what to expect and how to cope. The implications of this finding merit further study with women attended by midwives to examine difference in confidence and human agency during pregnancy and early labor to determine if intrapartum care provider differences emerge.

Strengths of the study findings include using interviews and focus groups, which have been shown to increase the understanding of phenomenon and interaction analysis, which improves the trustworthiness of our findings.<sup>16</sup> The consistency between our findings and midwives' perspectives on video calls in early labor<sup>13</sup> is also a study strength. Additionally, the mix of parous with nulliparous women added to the richness of our findings by showing the experiential value of previously giving birth, including identification of priority populations who could benefit the most from video calls.

Pregnancy and birth are human experiences encompassing critical relational encounters and physical aspects that

affect maternal satisfaction and overall childbirth outcomes. Video calls have potential to improve and optimize women's experience of early labor at home. Potential evaluative measures for an implementation study comparing telephone to video calls for early labor care are attributes of self-efficacy including measures of having confidence such as knowing if this is labor, when to leave home for the birth setting, and decision-making abilities, in addition to evaluating stage of labor progress at time of admission to the birth setting. These assessments underlie consistently contested aspects of early labor care at home.<sup>8,-10,23,34</sup> Importantly, widespread changes in systemwide prenatal education and intrapartum care provider practice patterns are also critical to improving women's experience of early labor and potential benefits of video calls.

## CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.

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