

“Sticky Baby Dust” and Emoji: Social Support on Instagram during In Vitro Fertilization

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Searching the Internet for health information is now routine; recommending and receiving medical expertise on social media platforms such as Instagram (IG) during medical treatment remains understudied. After analyzing more than 200 images on IG related to (in)fertility treatment, we employed a directed content analysis. In this manuscript, we investigate self-disclosure related to in vitro fertilization (IVF) treatment on IG and the types of linguistic (e.g., written affirmations, hashtags) and paralinguistic (e.g., emoji) feedback given in response. We found users on IG received emotional (e.g., expressions of care), informational (e.g., medical and treatment advice), tangible (e.g., gifted medicine and care packages), and belonging (e.g., #ttcsisters) functions of social support in response to self-disclosure (Uchino, 2004). By concluding that social media platforms allow for unique social support exchanges, we offer theoretical and practical implications for scholars, practitioners, and patients interested in social support, supportive communication, and emoji on social media platforms.

KEYWORDS: infertility, social media platforms, trying to conceive, mediated communication, paralinguistic cues

Introduction

In 2019, the Instagram (IG) hashtag #ivfjourney appeared in nearly 400,000 posts. The top post in February 2019 is an image in which dozens, if not hundreds, of needles are laid on a blanket in the form of a heart. The center of the image contains a onesie with the phrase “worth every shot,” as well as ultrasound pictures, a positive pregnancy test, and a letterboard with the phrase “Baby McGee Coming July 26, 2019.” The post has more than 3,000 “likes” and the comments are universally positive, paired with a range of emoji, including hearts of various colors, shapes, and sizes, congratulatory emoji (e.g., “Party Poppers” 🎉), and even a 🌈, signifying that this pregnancy may follow previous miscarriages or unsuccessful treatment cycles—perhaps this baby is a rainbow baby (Emojipedia, 2019). The image and the caption tell a story, the comments section reflects the richness of the narrative expressed in the image, and many commenters include emoji, which are defined as images representing ideas, emotions, or objects (e.g., 😊, 🍷, 🐼, or ❤️).¹ Beneath this post, one comment is a singular “loudly crying face,” (😭) suggesting the commenter is in tears or feels like crying, while another pairs 🥰 🥰 🥰 and the statement, “My heart is overflowing” (Emojipedia, 2019). Others recounted following the account during four years of disappointment and failed treatment(s); the emoji assisted users in expressing the longevity of their support and their heartfelt joy and excitement. Each congratulation and celebratory remark reflected the social support capacity of the platform, including remarks from strangers such as: “I just got so excited and I don’t even know you.”

The notion that a baby is “worth every shot,” the use of the “loudly crying face” emoji, and even the comments from strangers speak to the particular difficulties faced by those with an infertility diagnosis and/or undergoing fertility treatments. When undergoing time-sensitive, emotionally, and relationally taxing treatments potentially costing tens of thousands of

¹This is not to be confused with “emoticons.” Emoticons primarily express emotions and are made by manipulating punctuation for effect. Examples include :) or :(. Emoji (this term is both singular and plural) are images that initially reflected emotions. However, Emojipedia, (2019) currently uses Emoji Version 12.0, which includes 230 diverse additions such as a flamingo and a Hindu temple image, expanding the already extensive list. Most smartphone operational platforms allow the addition of an emoji package (including thousands of emoji) for free through an application. Emojipedia currently organizes emoji into the following categories: “smileys & people; animals & nature; food & drink; activity; travel & places; objects; symbols; flags.” (Emojipedia, 2019, n.p.)

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dollars such as in vitro fertilization (IVF),² many patients report feelings of anxiety, depression, loneliness, and isolation (Jensen, 2016; Johnson, Quinlan & Myers, 2017; Johnson, Quinlan & Marsh, 2018; Sandelowski, 1993; Willer, 2014). In previous research, we identified infertility as a health crisis (see also Steuber & High, 2015), which forces individuals to reevaluate their bodies, their social status, their short- and long-term plans, their conception of parenting and motherhood, and even their self-worth (Johnson & Quinlan, 2019). Scholars have addressed infertility as a social taboo (Johnson & Quinlan, 2019c; Jensen, 2016; Steuber & High, 2015), and suggested questions about one's fertility are an invasion of privacy (Bute, 2009). Broadly, *who* is infertile and how we measure fecundity (medically and socially) remains contested (Barnes, 2014; Bute, 2009; Jensen, 2016; Johnson & Quinlan, 2019; Sandelowski, 1993).

While it is estimated that between 7% and 15% of the population struggles to conceive (Center for Disease Control, 2018; Quinlan & Johnson, 2019; World Health Organization, n.d.), the discourse on IG around trying to conceive, or “#ttc” suggests that many considering or undergoing treatment are using social media platforms to give and receive social support as they share their experience. With more than a million posts using the “#ttc” hashtag, and with nearly 900,000 posts using “#ivf,” individuals are using IG who understand the experience of infertility and/or fertility treatments. The post outlined above, and the ensuing discourse in the comment thread, include the use of emoji emotive signifiers, which illustrate the diverse ways posters give and receive vital social support on social media platforms (see Lian & Grue, 2017). Patients undergoing IVF may experience these “paralinguistic cues” as a buffer from the negative emotional effects of infertility treatment and the increased stress these treatments place on their relationships, schedule, and bank accounts (Cutrona & Russell, 1990; Prada et al., 2018; Cohen & Wills, 1985). Moreover, examining the role emoji play in developing and fostering discourse around IVF affirms the exigency of providing social support to patients undergoing stressful treatments with

²The Mayo Clinic defines in vitro fertilization as “a complex series of procedures used to treat fertility or genetic problems and assist with the conception of a child” (2019, n.p.). During IVF, mature eggs are retrieved from the ovaries and fertilized with sperm in the lab setting. Later (e.g., 3, 5, or 6 days), the embryos are placed into your uterus (Mayo Clinic, 2019). As for intracytoplasmic sperm injection (ICSI, pronounced “icksy,”), this procedure resulted from the successful experiments of Dr. Gianpiero Palermo, who manually fertilized one egg with one sperm in 1992 (Barnes, 2014).

uncertain outcomes (Lian & Grue, 2017; Malkowski, Scott, & Keränen, 2016; Scott & Melonçon, 2018). Emoji will never “cure” or “heal” infertility, but their use illustrates the potential of paralinguistic cues as buffers for stress and loneliness in health crisis moments. To examine this we investigate self-disclosure related to in vitro fertilization (IVF) treatment on IG and the types of linguistic (e.g., written affirmations, hashtags) and paralinguistic (e.g., emoji) feedback given in response. Next, we overview literature related to social support and social media and discuss our rhetorical methodological practices.

Social Support and Social Media

SOCIAL SUPPORT

There are numerous definitions of social support and myriad ways to measure social support (both perceptions of and experiences with) in multiple academic fields (e.g., communication, psychology, education). Manuel Barrera (2000) described social support research in the 1980s and 1990s as “frenzied,” which resulted in a “deep literature . . . built over the past 20 years” (p. 216). Nearly forty years later, there are a range of categories, scales, and measurements used to describe, understand, and codify this “meta-concept” (Barrera, 2000, p. 218). In 2008, Terrance L. Albrecht and Daena J. Goldsmith maintained that within the realm of health communication and elsewhere, social support is rarely viewed as an isolated construct. Instead, it is more useful as an “umbrella term for . . . providing a sense of reassurance, validation, and acceptance, the sharing of needed resources and assistance, and connecting . . . within a web of ties in a supportive network” (Albrecht & Goldsmith, 2008, p. 269).

Research upholds the significance of social support and its association with better health outcomes (Cohen & Wills, 1985; Egbert et al., 2006; Rook, 1990). Findings show that, overall, individuals with increased social support have reduced levels of anxiety, depression, suicidality, and eating disorders, to name a few (Casey et al., 2006; Grisset & Norvell, 1992; Stice, Presnell, & Spangler, 2002). Because social support is a complex construct, many researchers subdivide it further. Manuel Barrera’s (2000) meta-analysis of the literature illustrates that “informational” and “emotional” were the most common forms of social support categories across a range of methodologies. Burt N. Uchino (2004) referenced the “functional components” of social support as emotional, informational,

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tangible, and belonging, framing social support as “the functions that are provided by social relationships” (p. 16). While the “emotional” and “belonging” functions act as more direct supports to emotional well-being and positive self-perception (e.g., “I care about you” and “me too”), “tangible” and “informational” support offer goods, services, or information to assist the individual in navigating a strenuous situation.

Several qualitative studies considered social support in virtual health contexts and found that virtual communication can be a source of support to communities struggling with health issues (e.g., people with a disability or illness such as diabetes) (Klemm et al., 1999; Loader et al., 2002; McCormack & Coulson, 2009). Recently, the rise in popularity of smartphones and social media apps offers a range of new digital contexts in which to examine these support systems. Instagram is one social media platform that experienced explosive growth since its launch in 2010; Instagram also offers a unique context for discourse and social support by focusing on images and limiting text, which encourages the use of emoticons.

SOCIAL MEDIA AND EMOJI USE

After launching in 2010, Instagram (IG) now boasts over 700 million active users, who post more than 95 million images and like 4.2 billion posts daily (Riley-Smith, 2013). IG relies on “users” (individuals or groups represented by a user account to post (i.e., upload through the application or “app”) their photographs and videos, accompanied by captions, hashtags, links, and emoji; together, we understand this material as “user content.” Hashtags (e.g., #ttc) populate both captions and comments on IG, and each hashtag is hyperlinked, making the acronym, word, or phrase searchable on the platform. Marília Prada et al. (2018) noted a “steep increase” in available communication including social media applications and social networks (p. 1925; see also Johnson, 2014) related to the popularity and efficacy of what they term “paralinguistic cues,” including emoji and emoticons. This study characterized the use of emoji, emoticons, and other paralinguistic cues as “pervasive” in our daily lives through product placement, in music videos, films (e.g., “the emoji movie), and, of course, on social media platforms (Prada et al., 2018, p. 1926).

The use of these platforms for seeking support for health-related issue or crises (e.g., attempts to stop smoking) is well-documented (Barrera, 2000; Cheung et al., 2017; High & Steuber, 2014; Steuber & High, 2015).

Scholars explored emoji and emoticons as they related to health and health outcomes (Skiba, 2016), interpersonal relationships (Hudson et al., 2015; Rodrigues et al., 2017), and even communication around emotional well-being (Harn, 2017; Novak et al., 2015; Riordan, 2011), all findings which address the discourses we observed on IG in the #ttc community. Regarding infertility, Keli Steuber and Andrew High (2015) surmised that the health crisis of infertility may encourage female patients to reach out more regularly to their social networks. That women use smartphones to establish interpersonal connections and do so with paralinguistic cues or imagetext reflects our cultural context (Prada et al., 2018; see also Jensen, 2016). Because nonverbal cues are crucial to message interpretation, posters on IG use emoji to enrich their messages, limit misinterpretation, signify an emotional state, or to signal complexities such as irony or sarcasm in the absence of verbal tone (Amancio, 2017; Prada et al., 2018; Riordan, 2011).

SOCIAL SUPPORT AND SOCIAL MEDIA

So how are emoji and emoticons paired with text representative of social support on social media platforms? Ren-Whei Harn (2017) found that college students utilized emoji on IG to build a supportive community (among other activities), and Brant Bursleson and Erina MacGeorge (2002) concluded, the study of social support is simultaneously the study of supportive communication, which they classify as verbal and non-verbal.

Within social media discourse, emoji act as rhetorical tools to signify social support by providing emotional, informational, belonging inputs, or by referencing tangible support (e.g., donating medicines or sending care packages), as well as a kind of self-disclosure (see Archer, 1980). These self-disclosures can reveal a shared experience such as failed IVF treatments and negative beta (pregnancy) tests. As Olaug Lian and Jan Grue (2017) argued, the construction and maintenance of these online communities are vital to social health movements because the use of symbols in those settings represent opportunities for meaning-making, belonging, and emotional support (see also Cohen & Wills, 1985).

RHETORIC OF HEALTH AND MEDICINE

Blake Scott and Lisa Melonçon (2018) framed the “rhetoric of health and medicine” as a “field of inquiry guided by rhetoric but shaped by and

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drawing upon a range of disciplinary and interdisciplinary bodies of scholarship” (p. 3). The interdisciplinary nature of this inquiry allows scholars to navigate a series of locations, texts, actors, and forms of discourse (Scott & Melonçon, 2018). Scholars engaged in this field of inquiry have purposefully engaged with “Web 2.0” and “Health 2.0” as online, Internet-based movements to demystify “medicalese” through patient-to-patient dialogue and support (Beemer, 2016; De Hertogh, 2015). Lian and Grue (2017) examined communal meaning-making in the Internet space, noting that, “the symbolic function of a virtual symbolic community lies in the personal, cultural, and symbolic meaning that we—the interpreters—attribute to it” (p. 175). If, as Beemer (2016) claimed, “the peer community online gives voice, power, and authority to patients in a space outside the doctor-patient relationship” than this project turns our focus to the margins, where patients use visual technologies to build digital communities. An RHM perspective situates patients struggling with infertility at the center of inquiry, where their experience is described as lonely, even isolating (Johnson & Quinlan 2019; Johnson, Quinlan & Marsh, 2018; Quinlan & Johnson, 2019). Moreover, we understand the symbolic power of emoji as text, which acts to underscore, extend, and potentially confound the text with which they are paired.

In the IVF community on IG, emoji provide a kind of script, demonstrating a particular subculture (e.g., the use of the shot emoji) where community members communicate with and through these shared symbols (Lian & Grue, 2017). Emoji can serve the purpose of clarifying, bolstering, or even confusing the intent of this supportive communication (Harn, 2017; see also Burleson & MacGeorge, 2002). To explore emoji significance and social support, we examined emoji use within a community likely to seek social support on a social media platform. To that end, we formulated the following research questions:

RQ 1: How do individuals in the #ttc community on IG use emoji as rhetorical devices in their communication about IVF treatment?

RQ 2: How do emoji illustrate or signify supportive communication through four social support functions (emotional, informational, tangible, belonging) for IG users undergoing or considering IVF treatment?

Methods

In a previous study, we (Johnson, Quinlan & Pope, 2019) compiled a dataset and examined multimodal elements (e.g., text, image, intertext, and hypertext) of IG posts. In the conclusion, we called for more research on emoticon and emoji use—emoticons being facial expressions made from punctuation marks (e.g., :) and emoji picturing a wide range of images, including people, feelings, objects, places, flags, food, and even jokes (see Footnote 1 for more information) (Emojipedia, 2019). In the initial study, emoji use provided excessive data. Since we agree that the “patient-narrator [is] the heroic subject of a self-authored story,” we returned to the data to perform a directed content analysis to try to mine and understand that story as it developed in the collected IG posts and ensuing discourse in the commentary (Lian & Grue, 2017, p. 186).

DATA COLLECTION

After Institutional Review Board approval, the authors and Rachel Ayers gathered the initial data between October 10 and 24, 2016. The study population was comprised of IG users with public accounts and the commenters in the first 25 responses to each post. The research team utilized hashtag metadata to collect hashtags with the greatest platform presence in reference to reproductive endocrinology and infertility treatment and IVF (Johnson, Quinlan & Pope, 2019). The team gathered hashtags based on their overall popularity as well as their pairings with other hashtags; #ivfsisters/ivfcommunity, #IVFfail/#infertilitysucks, and #ivf-journey, were often paired with #ttc, #ttcsisters, and #infertility. Initially, we captured 199 image sets, which included the original post, the caption of the post, and the first 25 comments. Despite the public nature of these posts, user demographics are not identifiable; images and account information do not need to reflect reality. We captured images that were then blurred for privacy (e.g., account names, pictures, demographics).

DATA ANALYSIS

To answer our research questions, the team utilized Hseih and Shannon’s directed content analysis of a subset of the original IG posts and the emoji used within those posts, which offered a format for recoding data that

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benefits from further context or development (2005). In our dataset, emoji use required further context and more in-depth study (Hsieh & Shannon, 2005; see also Patton, 2015). To create our codebook, we organized posts and comments in linear rows on a spreadsheet, beginning with the image and caption, and then the images of comments. We concluded that the layers of discourse were numerous, complicated, and interrelated (Malkowski, Scott & Keränen, 2016; Scott & Melonçon, 2018).

Relying on Bert N. Uchino's (2004) functional components of social support to guide our examination of discourse around IVF on IG, we performed two more iterative readings of collected data. The four components (emotional support, informational support, tangible support and belonging) are defined by Uchino (2004) as follows. Emotional support helps a person experience acceptance and is often communicated through statements focused on valuing an individual for their intrinsic worth and unique experiences. Informational support helps in defining, understanding, and coping with problematic events through a provision of information and resources related to the stressor, and as such, encompasses advice and cognitive guidance. Tangible support refers to a direct provision of material resources (e.g., clothing, food, medicine) or monetary aid. Belonging support reflects the "presence of others with whom to engage in social activities" (Uchino, 2004, p. 17, see also Rosen, Lafontaine, & Hendrickson, 2011). In our study, the "social activity" was discussing a health issue/treatment on a social media platform. Rhetoricians in health and medicine might refer to "social activity" as meaning-making through narrative health discourses (Malkowski, Scott, & Keränen, 2016).

Due to the size of the initial data set of 199 images, it resulted in thousands of emoji (2,000+) to analyze. To ensure a deeper analysis, we randomly selected 25 posts with comments. Across the 25 posts, the Third Author tabulated emoji use by the comment, for a total of 318 emoji. Given the recurrence of emoji use and type (e.g., red hearts), the team agreed to stop collecting at 318 comments as no distinct emoji uses emerged, reflecting saturation (Potter & Wetherell, 1987). To collect and code emoji usage, we designed a spreadsheet, placing each post in a numbered column with each comment of that post signified with a letter. For each emoji use, the following were noted in the spreadsheet: the alphanumeric comment, the official name of the emoji (as taken from Emojipedia.com), the emoji itself, the number of times the emoji was used within an emoji chain, whether the emoji was paired with text and/or other emoji (including which emoji).

Use of the same emoji consecutively (e.g., three red hearts) was treated as a single emoji in triplicate; in contrast, four different emojis in tandem (e.g., red heart, rainbow, sobbing face, green heart) were tabulated separately. After compiling and coding all 318 comments for emoji use, we reviewed the collected data and coded it for emotional, informational, tangible, and belonging functions of social support (Uchino, 2004). Table 1 includes our codebook, which is our interpretation of Uchino’s functional components of social support.

Next, we illustrated our coding process with images of coded comments sections, where we used corresponding colors to identify functional components *in situ*. Figure 1 represents the original image caption and the first four comments of the 25 we gathered for this project. The rest of the

Table 1. Codebook based on Uchino’s functional components of social support as they align with our data

Uchino Functional Category	Description	Example [Location; quote]	Code With (Color)
Emotional	Refers to statements focused on valuing an individual for their intrinsic worth and unique experiences	INSTAB,17: “Good luck for Monday [@username] am praying that u get the results u deserve ❤️”	EMOTL (yellow)
Informational	Assists in defining, understanding, and coping with problematic events through information and resources related to the stressor (e.g. advice and cognitive guidance)	INSTAB,1: “My clinic only do 3 day transfers and they has 755 pregnancies last year so they must be doing something right 😊”	INFC (blue)
Tangible	Refers to a direct provision of material resources (e.g., clothing, food, medicine) or monetary aid [among IVF participants this refers primarily to medicine]	INSTA,14: “👩 100% out of pocket here and follistims. I need to start on the 14 th and was going to put my order tomorrow. Just dmed you as well. :)”	TANG (green)
Belonging	Reflects co-engagement in social activities with peers [closely related to emotional but will reflect the specifics of IVF cycle experience]	INSTAC,5: “We are on the same cycle 😊 same as last month!”	BELONG (purple)

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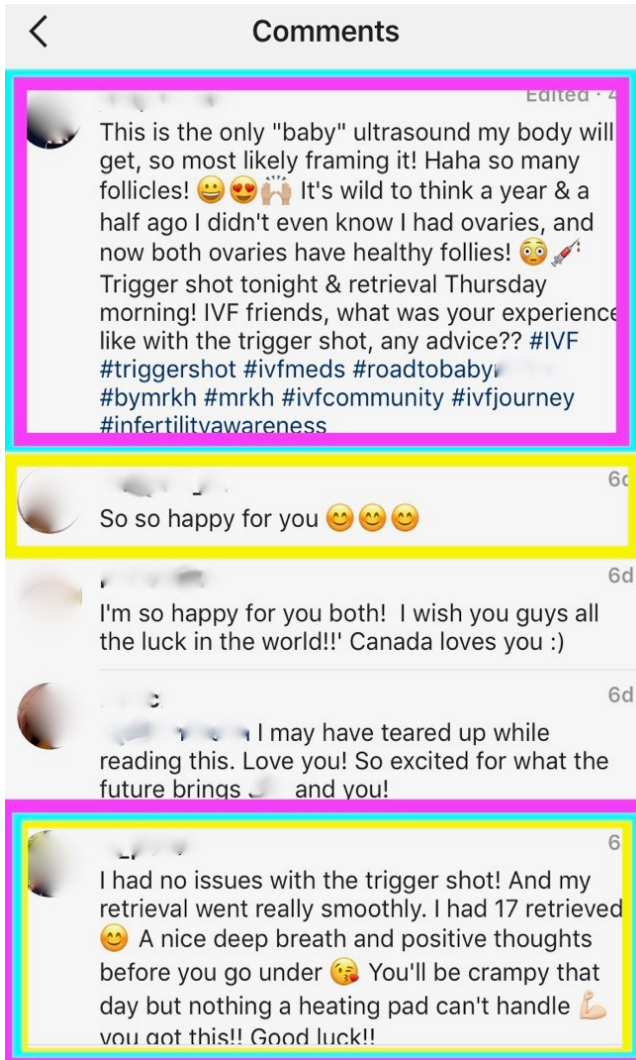



















Figure 1. Comment Coding: Emotional (yellow), Informational (blue), and Belonging (purple) Comments are marked with their corresponding color codes. Top comment has blue and purple; middle is coded with yellow; bottom is coded with all three, yellow, blue, and purple.

Table 2. Ten most popular emoji *in sticky baby data set*

Emoji Title	Emoji Image	Individual Uses in Full Sample	Social Support Coding
Red Heart		113	EMOTL, INFO, TANG
Folded Hands (All Skin Tone Variations)		56	EMOTL, INFO, BELONG
Face Blowing a Kiss		33	EMOTL, INFO, BELONG
Two Hearts		30	EMOTL, INFO
Party Popper		18	EMOTL, INFO
Raising Hands (All Skin Tone Variations)		16	EMOTL, INFO
Growing Heart		15	EMOTL, BELONG
Broken Heart		14	EMOTL, INFO
Smiling Face with Heart Eyes		14	EMOTL, INFO, BELONG
Smiling Face with Smiling Eyes		11	EMOT, INFO, TANG
Four Leaf Clover		10	EMOTL, BELONG
Blue Heart		9	EMOTL, INFO, BELONG
Flexed Biceps (All Skin Tone Variations)		9	EMOTL, INFO, BELONG
Kiss Mark		6	EMOTL, INFO
Face with Tears of Joy		5	EMOTL, INFO
Syringe		5	EMOTL, INFO
Winking Face		5	EMOTL, INFO

comments were coded as well; this image is merely representative of our process.

After the team agreed coding was complete, Pope designed a table, which ranked the ten most popular emoji in the dataset by usage. See Table 2.

Using the codebook and resulting tables, the research team identified three overarching themes surrounding social support and communication between individuals before, during, and after IVF treatment (RQ1) as well as how emojis communicate this support (RQ2). In the following section we will discuss our three themes.

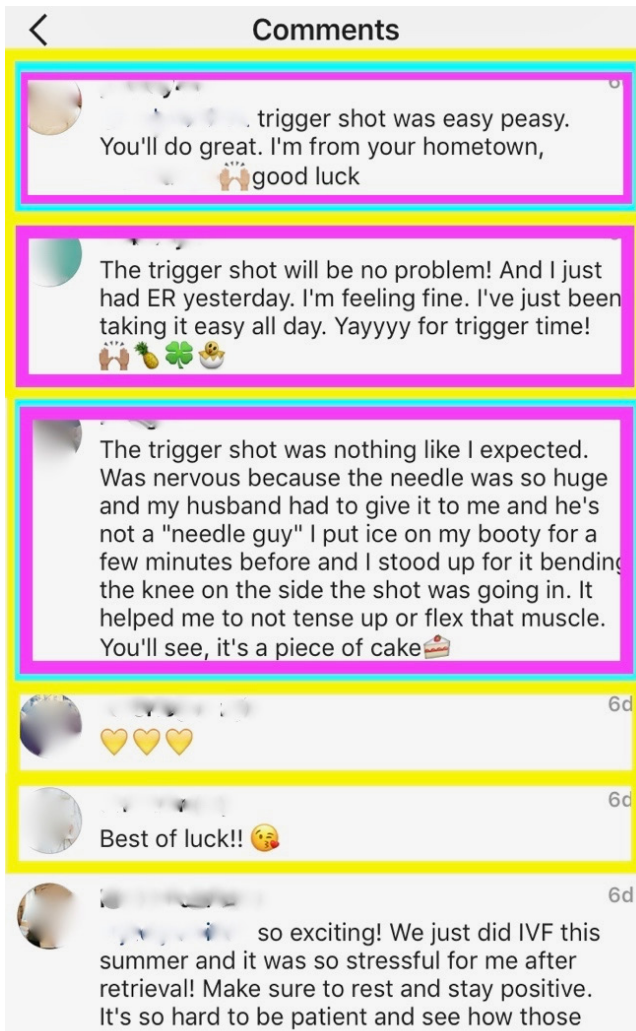


Figure 2. Comment Coding: Emotional (yellow), Informational (blue), and Belonging (purple). Comments are marked with their corresponding color codes. Top comment is coded with all three colors; second comment is coded yellow and purple; third comment is coded with all three colors; bottom two comments are coded with yellow only.

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The commenter offered a mix of prayers and wishes of luck, illustrating her seemingly sincere interest in the poster's journey and earnest hope that the embryo implanted. On another post, a user revealed she was six days away from transfer, and that she and her partner completed PGS (genetic) testing on their embryos, with one healthy, frozen embryo awaiting transfer. Another commenter provided very direct emotional support with text and emoji: "[user name] I can only imagine! You got this though 🍀 You have come so far and now it's time to bring your baby home!" While this is a direct, positive gesture of emotional support, it is premature as well. The user was a long way from bringing home a baby—more than 36 weeks to be considered full-term.

Posts that included self-disclosures of previous or current turmoil also prompted outpourings of emotional support: "As promised, I am putting on a smile and starting to cope with things." In the case of the user "starting to cope with things" (e.g., failed treatments and the decision to start IVF) commenters chimed in with, "We love you guys and care deeply! If you guys need anything, all you need to do is ask. Best of luck to you ❤️." And, "you got this! 🍀❤️❤️." We observed direct emotional support in the dialogue in the comments, including emoji without text. Posters often replied to comments, thanking people for their support and encouragement, and engaging in further self-disclosure: "I'm so nervous!" Acknowledgment between commenters is similar to that in face-to-face interactions; further self-disclosure, expressions of gratefulness, and dialogic emoji use (e.g., answering with ❤️) all demonstrate the emotional support posters perceived in these exchanges and their efforts to respond in kind. Emoji often signaled an emotive quality or function: hearts and four-leaf clovers suggest love, care, hope, and well-wishes, which all function as emotional support. Rhetorically, these emoji represent an emotive exchange, where the poster discloses and the commenter responds with a visual depiction of emotional engagement, which is in and of itself emotional support.

Belonging support functions by bringing together a group with similar experiences and interests (Uchino, 2004), what Lian and Grue (2017) termed "a sustained network of individuals" tied to a social movement linked through quasi-public online discussions" (p. 175). These discussions rely, in part, on symbols created within and sustained by these quasi-public discussions (Lian & Grue, 2017). In the IVF community on IG, individuals swapped stories about treatments, reactions to drugs, test results (e.g., genetic testing of embryos), and their protocol experiences (e.g., 3-day

embryo transfers), following each other's accounts for months or years at a time. In the practice of sharing their treatment journeys, commiserating about medicines, tests or treatments, and offering ongoing emotional support, belonging often seemed to function as another kind of emotional support. There are issues and struggles specific to infertility and IVF treatment that come up repeatedly, which fostered a particular discourse paired with appropriate emoji. For example, posters addressed medicines or treatment protocols they dreaded taking, had negative reactions to, or adverse experiences with. One poster commented, "Lovenox is starting 😊 2x/day. Boooooo ❤️🩸🩸." Interestingly, while the emoji "😐" is called "expressionless face" or "flat face" (Emojipedia, 2019) the poster is expressing exasperation, frustration, dread, or a combination. Those who belonged to this shared community which coalesced around infertility and REI treatments offered particular emotional support in these moments with responses such as: "Hated those suckers! Hang in there!!!!!" and, "The devil! LOL." Using only with emoji a commenter posted: "❤️👊." Another said: "The bruising with Lovenox is the worst! What we do for babies! 🤪🤪." The use of "we" paired with the flexing biceps suggests that the poster and commenter are part of a community—in this community, shots prove commitment to having children, as well as bravery (see also Lian & Grue, 2017). Another commenter provided, "Hang in there! I'm on heparin 2x a day. Keep your eye on the prize!! 🎯🎯." Even though the commenter used a different medicine, she expressed solidarity and encouragement—though our medicines are different, we are in this together; we are aiming for the same "prize," a baby. The similarities, shared experiences, and intense hopes can create a deep sense of belonging and emotional connection.

In other instances, posters addressed their previous ignorance about treatment: ". . . Haha so many follicles! 😊👊 It's wild to think a year & a half ago I didn't even know I had ovaries, and now both ovaries have healthy follies! 😊👊." Comments were encouraging: "Soooo exciting and happy for you both! 🎉🎉😐" and also referring to being in the same community (belonging): "I love this! This gives me hope! 🙏😐 I'm so happy for your guys! ❤️." In one instance, a poster self-disclosed the status of their own IVF cycle: The trigger shot will be no problem! And I just had ER (embryo retrieval) yesterday. I'm feeling fine. I've just been taking it easy all day. Yayyyyy for trigger time! 🙌🍷🍷🍷

In these posts, belonging is evident in a community of like-minded, experienced patients, and they will share their experiences and encourage

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their peers throughout the treatment journey. Not every patient discloses their fertility status or the details of their treatment plan with coworkers, friends, or family members, because it is not always a positive experience due to stigma (Bute, 2009; High & Steuber, 2014; Jensen, 2016; Johnson, Quinlan, & Marsh, 2018; Wirtberg et al., 2007). Hence, some IG users find a greater sense of belonging and emotional support on this social media platform than in their face-to-face relationships (see also Skiba, 2016).

TANGIBLE SUPPORT FOR IVF PATIENTS ON IG

This theme relates to tangible support and its unique function for patients undergoing IVF. Tangible support references material aid (e.g., a place to stay, a loan, a monetary donation, dinner delivery) (Uchino, 2004). Sheldon Cohen and Thomas A. Wills (1985) posited that stress is best relieved by supports linked to the specific need expressed. Thereby, tangible support is potentially most useful in situations of economic distress, which can also be experienced as emotional or belonging. For example, when patients experiencing stress over funding for medicine receive donated drugs from another IG user, they not only experiencing a buffering effect, but this interaction may also increase perceptions of belonging and emotional support, even in the absence of face-to-face communication (see also Johnson, Quinlan & Myers, 2017, Johnson, Quinlan & Marsh, 2018; Palmer-Wackerly & Krieger, 2014; Quinlan & Johnson, 2019; Willer, 2014).

Some posters offered unused medications and noted their expiration dates. One poster shared information about excess Gonal-f® and “mini-flare” (a reference to the dosage size) and Lupron expiring in less than a month. Some commenters simply acknowledged the importance of these posts, since drugs for a single IVF cycle can cost between \$5,000 and \$10,000: “God bless you 🙏.” One post offered Follistim® and Ganirelix but with this specific qualifier: “Only those who are paying out of pocket with no coverage please!” Each time vials, bottles, or injection pens were displayed, users flooded the comments section with pleas for the pharmaceuticals: “🙏 100% out of pocket here and follistims. I need to start on the 14th and was going to put my order tomorrow. Just dmed [direct messaged] you as well. :)” IG users in this community understand the high cost of treatment for those without insurance coverage. Further, those paying out of pocket can spend thousands of dollars more than those experiencing a minor reduction of prescription costs through insurance. Interestingly, the tangible support extended into the comments,

beginning new exchanges and relational connections: “Hey Girlie! I have a bunch as well, I have 250mcg ganorelix, 10ml progesterone, 4 viles of 75iu menopur and 300iu fossistim [Follistim®].” The ongoing dialogue in the comments section illustrated the potential for multiple commenters to find their own avenues of tangible support via the original poster (directly) or through other commenters (indirectly).

Occasionally, posters shared follow-up images of medicine received through IG or by other means: “Today I was gifted four of these (shows Menopur)! Each of these are about \$70–80 a bottle for self pay 😊.” Again, in the comments, other users offered medications, asked for leads, self-disclosed upcoming treatments and medicinal wish-lists, and made connections with one another. If tangible support is not as materially helpful in some contexts, it is extraordinarily valuable for IVF patients active on social media platforms who shared their appreciation through various hearts, folded (praying) hands and thumbs up emoji. For example, “we are truly blessed by this community ❤️🙏.”

For IVF patients, posts elucidating tangible support can also fulfill other forms of support (see also Cohen & Wills, 1985). Observers might feel emotional or belonging support viewing these exchanges between their peers, and informational support might result too, providing viewers a passive information stream about medicines, dosage, shipping methods, and cost differentials.

INFORMATIONAL SUPPORT AS LAY EXPERTISE

Finally, our data revealed the lay-based nature of informational support. Interestingly, we did observe technical experts posting information through their professional accounts. One practitioner, Dr. Zita West, founded a fertility clinic that focuses on dietary and environmental control methods to increase egg quality for IVF cycles. Even in these posts, patients advocated for themselves, disagreeing with Dr. West and referencing information from other sources: “I kind of disagree with this statement” or “Never ever blame yourself ladies!! We have a disease and salad is not going to help us xxxx.” This comment, which utilized “x” as a paralinguistic cue representing hugs, meant to counter the practitioner’s claim that “it all depends on the soil . . . think about it being the same for your eggs.” Interestingly, some of the medicines exchanged (e.g., Follistim®, Gonal-f®) are used to increase egg quality. So, while patients from all demographics with

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various health statuses can have eggs that test as “low quality” there are medical interventions available to improve the quality of retrieved ova. This is also representative of the ways patients resist biomedical power, practicing agency through the contestation of rhetoric about the body, the reproductive system and the metaphorical structures used in traditional medicine to frame dysfunction (see also Malkowski, Scott, & Keränen, 2016).

The other, more common form of informational support occurred from patient to patient. For example, one post offered: “progesterone in oil 🙋. Anybody else had blood SPRAY out after this injection?” One commenter noted that the first injection could cause bleeding: “Awww I’m sorry hun! My first one bled a bit but not quite like that 😊 hope the next one is easy peasy!” In another post on progesterone in oil, (used until the body takes over progesterone production around 10 weeks’ gestation) the user wrote: “I’m afraid, very afraid! 😬😬🩸.” One person proposed the following: “I was super nervous but it wasn’t bad at all! Actually yesterday I didn’t even know when the needle went in. Just gets sore after. Ice before and what [sic] and massage after ✔️” After more tips, the poster replied, “thanks, I really appreciate the tips- I’m putting a heating pad on now!” When users post issues with self-treatment or side effects, others self-disclose their own experiences, and with it, their experiential knowledge. While informational, these interactions may also function as belonging and emotional support, and increase individuals’ confidence to perform injections at home. See Figure 3.

In one post showing two fertilized embryos, the caption communicated a change in plans and ends with, “I’m also looking for any 3 day transfer success stories!” One commenter replied, “My clinic only do 3 day transfers and they has 755 pregnancies last year so they must be doing something right 😊!” This response provided quantitative data, but did not contextualize it—how many cycles resulted in 755 pregnancies? Alone, this number does not provide an accurate picture of the success rate of cycle day three transfers, but sharing a number like 755 is a clear attempt to foster confidence, along with the playful emoji and the quip, “they must be doing something right!”

Some informational support focused on self-advocacy. In one post, an IG “micro-influencer”³ in the #ttc community (who initially built her

³According to Shane Barker (2017) at *Forbes*, a “micro-influencer” on Instagram is someone with between 2,000 and 100,000 followers. With that following, account holders can charge over 100 and up to around \$250 per Instagram post for those interested in product placement or other forms of advertising (n.p.).

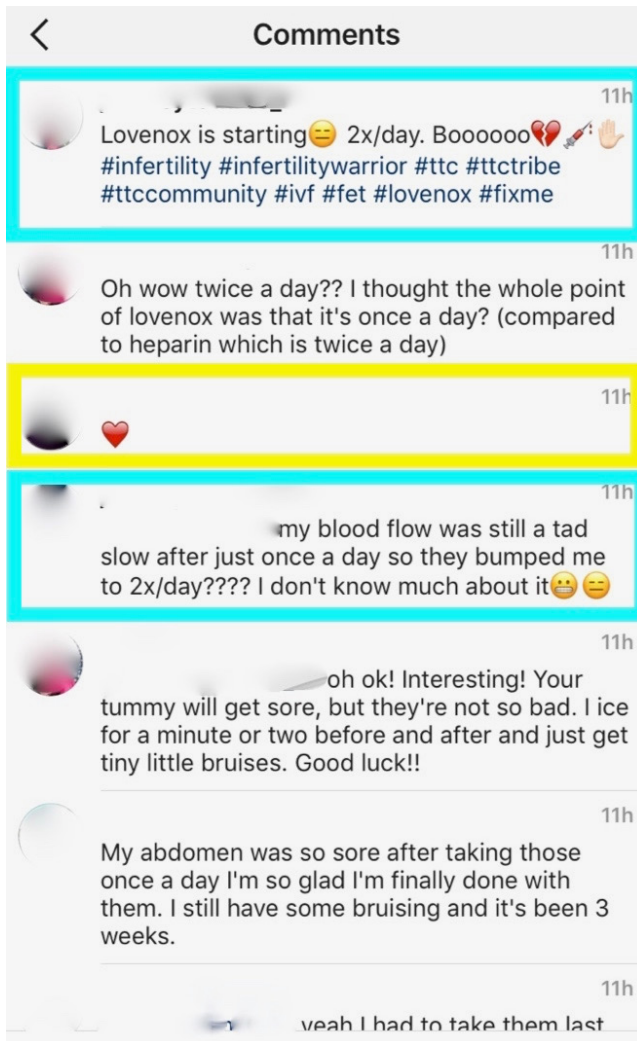


Figure 3. Comment coding: Informational Support (blue) and Emotional Support (yellow). Comments are marked with the corresponding color codes. Top comment is coded blue; middle comment is coded yellow; bottom comment is coded blue.

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following through her blog) addresses her diagnosis of Stage 3 endometriosis. In relaying the story to her followers, she said: “If you don’t take it seriously that KNOWLEDGE is POWER then you will allow this money making industry to run all over you (I know I said it).” The emoji utilized in the comments included two hearts, kiss marks, a blue heart, and red hearts. Respondents divulged their success stories and commiserated about their experiences of diagnosis and self-advocacy: “It is so hard when doctors won’t listen to you and act like you don’t know anything about your body 💕.” The poster responded to most of the commenters and used emoji in nearly every response. Her stated goal was to: “. . . help even just one woman through her journey that it was all worth it for me 🤝👩👧👦💕💕💕.” Here again we observe a contestation of biomedical power through narrative medicine to assert agency and simultaneously foster a sense of belonging (Beemer, 2016; De Hertogh, 2015; Malkowski, Scott, & Keränen, 2016).

Throughout these exchanges, it was complicated to parse what solely fulfilled the informational, emotional, and/or belonging functions of social support. This may be unique to patients in the #ttc community undergoing IVF cycles; information is necessary to make decisions about reproductive endocrinology and infertility doctors and practices, protocols, injections, and managing side effects, but the very exchange of this information provides emotional support and may foster a sense of belonging between people living through similar experiences. Each interaction likely served a number of support functions, in some cases with significant impact: “Because of you I have the strength to do a 3 Rd [3rd] cycle.”

Discussion

Earlier in social support research, some scholars (Culnan & Markus, 1987; Walther, 2006) surmised that face-to-face communication can be preferable to digital or computer-mediated-communication because non-verbal cues (e.g., body language, facial expressions) are less apparent online (see also Danesi, 2016; Riordan, 2011). Prada et al. (2018) noted the importance of paralinguistic cues such as emoji and emoticons in making digital exchanges deeper and more emotionally rewarding.

As Roland Barthes (1967) argued, signs are more complex than these literal interpretations. There are two levels of signification—the primary and the secondary (Barthes, 1967). Primary signification is the most superficial level at which a signifier functions (e.g., a red heart signifies love), while

secondary signification takes place when the primary sign also acts as a secondary signifier (Barthes, 1967). Returning to the example of the crying face, this emoji signifies sadness or grief at the primary level and empathy at the secondary level, possibly preserving the intended emotive response, which may be lost in text-only messages which positions these symbols (emoji) as social support tools (Amancio, 2017; Riordan, 2011). We found that emoji become secondary signifiers when paired with text, allowing for new meanings, which extend, deepen, or complicate the commentary. For example, if an “outsider” did not know what Lupron was, they could understand it was an injected medication after seeing the syringe emoji, with additional emojis of distressed faces intimating feelings related to injections.

We agree that anonymity, as well as a sense of belonging, can encourage further self-disclosure, especially through alternative or anonymous online identities (Beemer, 2016; De Hertogh, 2015; Joinson, 2001; Prada et al., 2018). Similar to Marília Prada et al. (2018), we observed the semiotic pairing of text and paralinguistic cues functioning as social support by producing commentary with rich and complex meanings, even within short posts. The particular importance of these paralinguistic and textual combinations for the #ttc community undergoing IVF treatment are multiple: they may provide unique forms of emotional support and informational support in that they can provide instantaneous and also longer-term support (e.g., weeks or months later when people find the comment stream and add their thoughts).

IMPLICATIONS, LIMITATIONS AND FUTURE RESEARCH

In this analysis, we isolated the role of emoji to better understand the intertextual, rhetorical nature of four functions of social support (emotional, informational, tangible, and belonging) on IG during infertility treatment. Although we were unable to ascertain each users’ satisfaction with the support, we argue that a close study of emoji deepens social support literature; our findings revealed that emoji play a powerful role in the creation and continuation of the #ttc community and IVF sub-community coalescing around the crisis of infertility. Characterized by a unique form of discourse—favoring certain expressions (e.g., ❤️) and wrestling with particular issues (e.g., “the two-week wait”)—this dialogue illustrated the rich possibilities of social media platforms as spaces of social support. The linkages to tangible support are particularly provocative here—online comments and attendant

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emoji use are not primary interactions to examine for tangible support, yet in the IVF community, tangible support was an important and powerful element of dialogic exchange. Sheldon Cohen and Thomas A. Wills (1985) and others, who studied the “buffering” effects of social support on stress, concluded that social support could decrease perceptions of stress and protect physical and mental health (see also Cutrona & Russell, 1990). In the majority of interactions, users expressed their gratitude for this community and the role it played in their personal life and health journey.

Our findings reflect that emoji serve a social support function for individuals struggling with a health crisis. As such, we did not examine emoji use across other forms of IG discourse, between sub-communities (e.g., IVF vs. surrogacy) or compare emoji use between groups experiencing different health crises (e.g., infertility vs. breast cancer). We did not code emoji use demographically (e.g., male, female, non-binary, same-sex couples, urban, rural, etc.) so we cannot comment on the ways emoji may be used differently among subsets of the population.

We are cognizant that there are instances for which emoji and emoticons, as rhetorical signifiers, may prompt ambiguous or even negative perceptions of social support since meanings are both related to and distinct from the image (e.g., an eggplant emoji often represents a penis). This alone can introduce confusion, ambiguity, and/or misunderstanding and potentially lead to stress and anxiety (see also Novak et al., 2015). Emoji and emoji and text pairings also represent the particular social and emotional environment of the digital world, which is always in flux, and contested among and between communities (Beemer, 2016; De Hertogh, 2015).

Recently, *The Verge* discussed the ways in which varied interpretations of paralinguistic cues and imagetext (such as emoji and emoticons) are impacting court cases in unforeseen ways (Lee, 2019). In a 2017 case, emoji were used to establish a couple’s “intent to rent” an apartment, namely, an enthusiastic text paired with a champagne bottle (Lee, 2019). Imagetext pairings will continue to become more diffuse and potentially more complicated as a result. As *Miami Herald* reporter Ana Veciana-Suarez (2019) articulated:

Emojis, it seems, can be fraught with misinterpretation. Forget cute. Forget funny. They have become a potential minefield in the vast and varied land of human communication—yet more proof

that what might be crystal clear to one person is nonetheless murky as river bottom to another. (n.p)

The literature is clear that millennials utilize emoji—but how will this generation and future generations reinvent ways to communicate with new images and other symbols? How will this usage shift over time, and what images, symbols, or practices could replace emoji use? As RHM scholars (e.g., Beemer, 2016; De Hertogh, 2015; Scott & Melonçon, 2018) have intimated, rhetoricians of health and medicine are well-suited to the necessity of observing, coding, and analyzing these “messy” paralinguistic conversations, full of multilayered meanings, forms of discourse, and types of rhetorical tools. Like Beemer (2016), our research (Quinlan & Johnson, 2019) highlights the conceptual “mess” of time in these spaces—namely asynchronicity. While IG posts often draw immediate and rapid-fire responses, posters can add to the conversation at any time, even weeks, or months later.

Some IG users return to conversations or start new posts when interactions with medical practitioners go poorly and they become anxious or have remaining questions. In the asynchronous discourse of IG, users can always search with tags and hashtags to find posts that might speak to and/or relieve their fears (see also, Beemer, 2016). Similar to Beemer (2016), we believe this investigation of paralinguistic cues and imagetext on IG highlights yet another marginalized group in medicine, and reframes that usage as central not only to the infertility journey, but potentially, other patients in crisis.

We hope rhetoricians engaging with health and medical topics will investigate patients’ perceptions of emoji use on self-disclosure. For example, future researchers could ask patients what was most helpful when they disclosed and what others in the community could have done to support them better. What emoji or emoji and text combinations most encouraged or silenced further disclosures? Like De Hertogh (2015), we wonder about the ambiguity arising from patient communities establishing new norms through shared meaning-making in emoji discourse. We anticipate health-care teams will address supportive gaps where individuals sought support on social media, either by altering the supports they offer or guiding patients to these online communities. We remain optimistic that health-care teams will take IG seriously as a resource for their patients, allowing for more holistic care. Finally, scholars might investigate how (and which)

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emoji are used in health-related subgroups for other diseases, illnesses, disabilities, or treatments.

Another fruitful line of research is to examine social support and emoji through other social support measures. For example, in Manuel Barrera's (2000) taxonomic discussions over three decades of social support literature, other scales included "network orientation," "perceived availability of support behavior" (p. 219) or other social support functionalities including "nondirective support" and "directive guidance" (p. 220). What are the potential implications of using emoji that do not follow group rules and expectations and/or how can misunderstandings or misinterpretations lessen feelings of social support or inclusion? As De Hertogh (2015) found, groups formed around a particular health issue can foster feelings of empowerment, but can also entrench new best practices, causing users to perceive their experience as falling short of emergent norms.

Scholars in various fields already acknowledge individuals can benefit from disclosing complicated emotions and sharing health-related information and imagery. Social networking sites such as IG offer an unprecedented opportunity to study imagetext-based discourse during health treatment. When an individual experiences frustrations and disappointments around IVF treatment and then disclose that information on a social media platform, they may feel raw and vulnerable (Johnson, Quinlan & Pope, 2019; Quinlan & Johnson, 2019). The anonymity possible on many social media platforms is useful here—many users disguise their identities through specific account named for their infertility journeys, which are not connected to their names (e.g., IVF_2019forbaby, modeled after an account name). Given that users both disguise identities and seek out the community on IG in place of or in addition to face-to-face relationships, this level of self-disclosure makes more sense. The platform and the sub-community coalescing there allow individuals to receive emotional, informational, tangible, and belonging supports in real time, when medical practitioners or family members might not be willing or able to offer these supports. In this context, a pink heart and a flexing bicep are not comical additions to a text chain or Facebook comment, but a set of symbols that provide emotional support with the message: "I care and I believe you can do this. Keep going," or perhaps, "I love how strong you are. You've got this," or even simply, "I see your strength."

IG provides a space for asking questions, seeking medical advice and expertise, and finding social supports not necessarily available in traditional healthcare (see also Beemer, 2016). Though emoji and text pairings can offer solace and comradery during a difficult time (see Beemer, 2016; De Hertogh, 2015), emoji will not help individuals receive that “big fat positive” (BFP) or beta test signifying a pregnancy. However, this discourse may assist patients in celebrating a BFP on social media, or deriving hope and encouragement from another’s success. And if another’s BFP causes feelings of jealous, anxiety, or grief, it is easier to step away from IG than it is a business lunch or gathering of friends. As one poster exclaimed: “After a very difficult two years we cannot wait to meet our little miracle in March 🍀.” One commenter typed, “That baby girl is going to be soooo loved❤️❤️❤️❤️❤️. So happy for you!” Alternatively, one poster reported, “I have three dots on my right wrist, to always remember our three babies that might have been . . . I remember so vividly the grief we felt for so long. . . . In the midst of incredible blessing, I remember❤️❤️❤️.” Another commenter responded, “You, my dear, are nothing short of amazing.🍀”

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