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Evaluating the Use of Text Message Communication in a Postpartum Patient Navigation Program for Publicly Insured Women

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Abstract

OBJECTIVE: To compare communication between navigators and women according to follow-up status in a postpartum patient navigation program (“Navigating New Motherhood” [NNM]).

METHODS: This is a mixed methods secondary analysis of text message and email transcripts from NNM. Transcripts were analyzed by number of messages sent, received, and unanswered. Message themes were qualitatively analyzed using constant comparative technique. Bivariable and multivariable tests were conducted.

RESULTS: Most women (98.2%) communicated with navigators via text message. Women who completed postpartum follow-up sent and received more texts than women who did not (7.8 vs. 3.7, $p<0.001$ and 11.5 vs. 8.0, $p<0.05$, respectively); exchange of 6 messages was associated with greater odds of follow-up (adjusted odds ratio 2.89, 95% CI 1.13–7.41). Lack of patient response was also associated with lack of follow-up ($p<0.001$). Four categories of message themes were identified: Rapport-building, Postpartum Care Coordination, Maternal Health, and Motherhood. Message threads with more Rapport-building or Maternal Health messages were associated with more frequent patient follow-up ($p<0.01$ and $p<0.05$, respectively), as was average number of emoticons per message thread (2.1 vs. 1.2, $p=0.01$).

CONCLUSION: More frequent and multidimensional communication was associated with follow-up in a postpartum patient navigation program.

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Keywords

mHealth; patient navigation; patient-navigator communication; text messaging; postpartum

1 Introduction

Patient navigation is a promising means of addressing systemic health inequity [1–6]. By mitigating mistrust of the healthcare system, low health literacy, financial barriers, and lack of social support [1], patient navigators can promote patient self-efficacy and encourage sustained patient engagement with care [7]. Patient navigation interventions have demonstrated success in a range of clinical settings, including cancer screening and postpartum care [2, 5, 7, 8]. In such settings, effective communication and relationship skills employed by patient navigators seem to be important in obtaining positive outcomes [9, 10]. Previous studies have highlighted the critical role of empathy in these relationships, as well as the need for individualized support and development of trust [4, 9, 11, 12]. Yet, best practices for communication within patient navigation remain an open question [13].

One rapidly growing communications practice in healthcare lies in mobile health (mHealth) through short message service (SMS) text message communications [14]. As a platform for interventions in a broad range of health contexts, SMS messaging has been shown to be an informal, non-judgmental, inexpensive, and rapid response medium for patients to connect to care [14, 15]. Health appointment reminders increasingly use text messages in lieu of traditional phone call reminders [16], and sending healthcare-related text messages has been found to improve physical and mental health metrics while achieving high patient and physician satisfaction [15, 17]. In the specific context of women's health, text message interventions have been used to increase antenatal care receipt [18], to facilitate postpartum follow-up in women with gestational diabetes [19], and to improve postpartum HPV vaccination [5].

Text message use may also support communication in the context of patient navigation. Navigating New Motherhood (NNM) was a unique patient navigation program that sought to increase the frequency of postpartum care attendance in a tertiary care center practice serving predominantly low-income, minority women. The NNM program (described previously) [8] provided postpartum appointment scheduling assistance, appointment reminders, assistance with logistical barriers, and social support to mothers. In accordance with patient preference, the NNM program relied predominantly on SMS text message communication between patient navigators and women enrolled in the program.

Although many studies, including NNM, have assessed the benefits of patient navigation, few have examined communication between patient navigators and the individuals they serve with respect to patient outcomes. The aim of this study was therefore to compare communication between navigators and women according to follow-up status in a navigation program focused on increasing postpartum appointment attendance. NNM's primarily mHealth-based approach provides unique access to communication transcripts addressing this question. Characterizing such communication sheds light on the nature of the patient navigator role and the ways in which navigators convey empathy and build relationships.

Furthermore, given the rising popularity of both patient navigation and mHealth, it is important to understand how the two work in concert with one another, and to assess how using mobile phone and SMS technology may benefit the patient navigation model. Through this understanding, we may provide insight into how enhanced medical interpersonal relationships can be achieved using a text-based platform, with the goal of improving efficacy of patient support initiatives such as navigation programs.

2 Methods

This is a secondary analysis of data from the NNM study [8]. Briefly, NNM was a prospective patient navigation program initiated within a hospital-based women's health clinic at a university tertiary care center located in Chicago, Illinois. All women who received prenatal care at this site were invited to participate. Women who enrolled in NNM received highly individualized postpartum support. Patient navigation services included shifting the burden of scheduling the postpartum follow-up appointment from the patient to the navigator. The navigator provided routine reminders of appointments, offered brief written and verbal counseling about contraception, served as a bridge to the health care team, assisted with social work needs, and served as an additional resource and source of psychosocial support.

The NNM program incorporated frequent patient-navigator communication about a wide variety of logistical, educational, and supportive topics. Upon enrollment, patients indicated whether they preferred text message (SMS), phone call, or email as their primary communication method. The navigator contacted patients a minimum of three times: one week after delivery, one week before the scheduled postpartum appointment, and one day before the scheduled postpartum appointment. However, the ability to initiate conversation did not lie solely with the navigator, and navigators remained directly and easily accessible to patients outside of these specified contact points. Thus, communication frequency, duration, and subject matter varied between patients. Beyond the minimum communication expectations, both the navigator and patient controlled the frequency, tone, length, and content of messages, as well as whether emoticons were used. Navigators were provided training with postpartum support and resources as well as in cultural competence and professionalism, but were otherwise instructed to communicate with each patient as they felt was most appropriate. For example, if a patient requested more support or was particularly bonded with her navigator, further communication was encouraged; however, if a patient requested to only communicate appointment reminders, such preferences were honored. Additionally, navigators directed specific medical questions to clinical staff.

We performed a mixed methods analysis of the communication that took place between navigators and NNM participants, comparing qualitative and quantitative communication patterns between patients who did and did not complete postpartum follow-up. Transcripts of text message and email conversation were obtained and coded manually using qualitative techniques described below. Communications that took place over the phone or in person were not analyzed due to a lack of available data. Messages that were blank, sent by accident, or that only corrected previously-sent errors were infrequent and were not considered to contain data; thus, they were not included in any of these analyses.

Given the lack of an existing published framework for analyzing text messaging communication, we designed a framework via internal expert discussion and generated a set of rules for analysis of transcripts. These rules are visually depicted in Figure 1. Transcripts (*message threads*) included the entirety of digital communication between the navigator and each patient over the course of the program. This digital communication was coded for message themes. A *message theme* was defined as message content pertaining to a specific topic. The qualitative coding of message themes was performed via the constant comparative method. Transcripts were read independently by two investigators, who then cooperatively generated a list of message themes. Transcripts were independently coded by both investigators according to this codebook; a third investigator read portions of transcripts to resolve discrepancies when needed. Each assignment of message theme was agreed upon by at least two investigators.

The quantification of message themes occurred according to the number of conversations between a patient and the navigator. A *conversation* was considered to be an exchange that maintained continuity in at least one message theme. Given this continuity, a conversation could take place over a few minutes or over the course of several days. Each message theme was counted no more than once per conversation. Independent texts that went without response were counted as one conversation, as long as they relayed content pertaining to at least one message theme. Additionally, individual texts could contain one or multiple message themes. A conversation could contain one or multiple message themes, but the occurrence of a given theme was recorded at most once per conversation. New conversations were identified by both a change in message theme in addition to a break in the continuity of communication (i.e., after at least several hours had passed); the amount of time passed was identified by time stamps available within the transcript. Once a new conversation was initiated, a previously counted message theme could be counted again. Occasionally, in the event that patients did not respond to the initial introductory message, another introduction message would be sent (and thus introductory messages could occur multiple times for a given patient).

We clustered related message themes into overarching communication categories. We then performed a comparative quantitative analysis of communication patterns using these broad categories, with areas for analysis determined after the qualitative coding process by internal team discussion. Comparing patients who completed postpartum follow-up versus those who did not, we examined differences in the distributions of: 1) quantity of different communication categories, 2) total number of texts sent by the navigator, 3) total number of texts received by the navigator, 4) number of messages containing emoticons (sent by either party), 5) number of texts sent by the navigator containing questions or prompting a reply (e.g. "Please confirm") that went without patient response, and 6) percentage of patients who did not respond to at least one text from the navigator prompting response.

Quantitative analyses were performed using t-tests and chi-square tests, as appropriate. Additionally, multivariable logistic regression was utilized to evaluate the independent relationship between sending 6 messages and the odds of returning for postpartum follow-up, with adjustment for potential demographic confounders that reached a level of $p < 0.05$ on bivariable analyses (marital status and education). Six or more messages were chosen as the

threshold based on qualitative analyses suggesting this was the point at which conversations between patients and navigators achieved a minimum threshold for meaningful content beyond introductions and basic scheduling communication. Qualitative analyses were performed by hand and with Microsoft Excel (Microsoft Corporation, Redmond, WA). Statistical analyses were performed using Excel and R (The R Foundation, Vienna, Austria). As this was an exploratory study of a predetermined population, no sample size calculations were performed. All tests were two-sided and $p < 0.05$ defined statistical significance. The Institutional Review Board of Northwestern University approved this study, and all participants provided written, informed consent.

3 Results

The NNM cohort ($N=218$) consisted of predominantly non-Hispanic Black (49.5%) and Hispanic (32.6%) women. Approximately one-third of women were primiparous, and about thirty percent were married. Every woman who participated in the program was enrolled in public insurance for prenatal care [Table 1]. While the program was in place, the majority of enrolled women (88.1%) returned for their postpartum visits at an average of 6.2 weeks postpartum.

Women reported high access to mobile communication technology, including possession of a phone with unlimited texting plan [Table 1]. Women also preferred communicating through texts, so almost all (98.2%) were contacted via text message. A total of 216 message threads were available for analysis. Message threads varied in length, with the shortest consisting of only three messages sent from the navigator, and the longest consisting of more than thirty messages exchanged between the navigator and the patient. The majority of messages were sent by navigators.

Significant qualitative and quantitative differences in communication characteristics emerged between women who completed postpartum follow-up and those who did not. First, women who completed follow-up both sent and received a significantly greater number of messages (Fig. 2). An exchange of 6 messages was associated with greater odds of follow-up on (odds ratio [OR] 3.25, 95% confidence interval [CI] 1.35–7.82), and this association remained significant after adjustment for marital status and maternal education level (aOR 2.89, 95% CI 1.13–7.41). Women who completed follow-up also had a lower mean number of navigator-prompted messages that were unanswered [Fig 2] and a higher frequency of responding to all messages (60% vs. 20%, $p < 0.001$).

The message themes, which emerged in the communication between patients and navigators, were clustered into four overarching categories used for comparative analysis. Each of these four categories consisted of several themes (Table 2). The first category consisted of relationship-oriented messages, which we classified as Rapport-building. These messages introduced the navigator, contained supportive/encouraging messages, or inquired about the wellbeing of the patient and her family. The next category, Postpartum Care Coordination, included messages pertaining to postpartum appointment attendance. These messages included appointment logistics—time and date of the appointment, transportation, purpose of the postpartum appointment, or coordination with other pregnancy-related follow-up

appointments. The third category, Maternal Health and Transitions, consisted of messages relating to health care, including: contraception, mental health support, coordination of other specialty health appointments (unrelated to pregnancy or mental health), health insurance, or transition to primary care. The final category, Motherhood, included messages related to finding a pediatrician, coordinating childcare, maternity leave, or breastfeeding. A small proportion of messages was research-related and was excluded from the qualitative analysis.

Communication between patients and navigators included a range of 1 to 13 distinct message themes; the majority of women in the cohort had 2–6 message themes. [Fig. 3]. The most frequently occurring categories were Rapport-building and Postpartum Care Coordination, which accounted for 44.3% and 42.9% of all messages sent, respectively. Text messages falling under Maternal Health and Motherhood categories were addressed less frequently (5.5% and 4.1% of all messages, respectively) [Table 3]. Most Rapport-building messages were either supportive messages or introductions by the navigator. For Postpartum Care Coordination, the majority of messages pertained to the logistics of the postpartum appointment itself. Within the category of Maternal Health, contraception was the most common message theme. In the category of Motherhood, most messages were about coordinating childcare during maternal medical appointments [Table 2].

The content of the communication between patients and navigators varied between the two groups. Specifically, the communication of women who returned to care contained significantly more Rapport-building and Maternal Health messages than those of women who did not [Table 2]. There were no significant differences in the mean number of Postpartum Care Coordination or Motherhood messages between the two groups [Table 2]. We also observed that messages between navigators and women who completed postpartum follow-up contained a higher number of emoticons exchanged by either the navigator or patient [Fig. 2]. Nearly all of the emoticons sent were a basic smiling face made from a colon and a single parenthesis bracket, seen in Figure 1.

4. Discussion and Conclusion

4.1 Discussion

In prior work, we found that implementation of a patient navigation program was associated with significantly increased postpartum appointment attendance in a university-affiliated clinic for publicly insured women compared to women who received care prior to the program [8]. Consistent with prior findings, women in the NNM program demonstrated high mobile phone ownership and access to unlimited texting [20]. Women's preference for texting as the chosen mode of communication was also notable in this cohort. We hypothesized that the interpersonal skills of the navigators were largely responsible for the program's successes. Because the majority of navigation took place by SMS, these data were available and provided an ideal opportunity to analyze patient-navigator communication. Our findings illustrate that certain communication characteristics, including more frequent exchange of messages and greater use of rapport-building- or maternal health-oriented messages, are associated with an improved likelihood of return.

Message frequency and message content appear to be critical communication features of effective patient navigation. Rapport-building messages were the most frequently observed type of communication across all message threads, and they were significantly more frequent among patients who ultimately completed follow-up. These results are consistent with previous studies emphasizing the importance of relational qualities and the ability to build trust within the patient navigation model [9]. This study furthers previous work by assessing potential communicative routes through which such trusting relationships may be built. For example, messages that introduced the navigator may have given an initial sense of humanity to the interaction. . Subsequent supportive and social messages likely strengthened the relationships between patients and navigators. We hypothesize this type of communication allows patients to become more motivated and comfortable in returning to care. All navigator messages were entirely individualized and all communication took place between the patient and the navigator directly. This individualized personal support likely contributed to the impact that rapport-building messages had on patients' perceptions of this relationship and to the success of the program as a whole. Thus, while increasing the sheer amount of contact a woman has with her health care team may assist in facilitating retention, the quality of these increased interactions also appears to be important.

The limitations of this observational analysis should be noted. Principally, NNM sought to address disparities in postpartum follow-up rates by mitigating patient-level barriers, rather than by addressing the structural sources of these barriers. Some barriers, like inadequate literacy, may have prevented women from participating fully in the program and from reaping the benefits of expanded communication with the navigator. This barrier could explain message threads which contained few to no responses from patients. Similarly, the association between fewer responses and failure to attend the postpartum appointment could indicate that women who did not return were simply busier individuals and therefore less likely to respond to text messages. Finally, in light of lacking patient response, we could not guarantee that all messages were received as intended. Our analysis was unable to explore such potential explanations.

Future directions include developing a deeper understanding of the precise qualities of communication between patients and navigators that optimize patient engagement, self-efficacy, and health outcomes. Emerging aspects of communication, such as the exchange of emoticons and pictures, warrant further exploration. Given the rapid pace of mHealth technology development, the adoption of new communication strategies or styles by patients and navigators may be key to helping navigation programs stay contemporary and achieve their full potential in improving health outcomes.

4.2 Conclusion

In summary, our findings suggest mobile health patient support interventions may be particularly successful if they allow for individualized and multidimensional support related to the health care episode. As evidenced by the wide array of message themes that emerged throughout NNM communication, reasons for remaining engaged in care or failing to follow-up are multiple and dynamic. We found that in this context, follow-up may be improved by the ability of navigators to communicate about subjects that extend beyond the

logistics of scheduling and reminders. Consistent and individualized support from a reliable and known individual may contribute to making patients feel valued, respected, and cared for, thus incentivizing them to engage in recommended care. Such individualized care is often resource-intensive, yet the potential for improved health outcomes suggests this model warrants further exploration and study. Further, although text-based communication differs from in-person communication, lessons on the importance of strong relationships may span both.

4.3 Practice Implications

Both prior reports and our data suggest texting is likely to be a feasible and favorable platform of mHealth to be used within patient navigation programs for similar patient populations. Moreover, we identified specific patterns of texting that may be particularly effective. For example, exchanging a greater number of messages was associated with greater likelihood of follow-up. We hypothesize that a higher number of total messages exchanged provided more opportunities for patients to express concerns and needs, ultimately increasing patient investment and self-efficacy. In particular, we found that an exchange of 6 messages was associated with greater odds of follow-up; this finding offers an estimate for a potential minimum amount of communication to take place between a patient and a navigator in an effective patient navigation program.

We confirm all patient/personal identifiers have been removed or disguised so the patient/person(s) described are not identifiable and cannot be identified through the details of the story.

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Highlights

- In a postpartum navigation program, text messaging was associated with retention.
- Rapport-building and maternal health messages were associated with follow-up.
- Text messaging may be a favorable communication mode for patient navigation.

PRACTICE IMPLICATIONS:

Text messaging can serve as a favorable communication platform within patient navigation.

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Figure 1: Example Transcript of Digital Communication between Patient and Navigator illustrates the qualitative methods used in our analysis framework. In addition to four distinct themes, this example message thread would also be counted as having one emoticon, three messages to which the patient did not respond, six texts sent by the navigator, and three texts sent by the patient. Each theme is counted multiple times within the thread, but only once per conversation.

*Indicates $p < 0.05$

**Indicates $p < 0.01$

Figure 2. Quantifying Total Exchanges with Navigator

depicts the significant differences in communication characteristics observed between women who did and did not complete postpartum follow-up. On average, navigators sent a greater number of texts to women who eventually completed follow up. Women who completed follow up were also more likely to respond to these texts than women who did not follow up, and they also exchanged a greater number of emoticons compared to women who did not follow-up.

Figure 3. Total number of message themes per patient

shows the number of message themes that occurred in communication between patients and the navigator. Figure 2 illustrates that the vast majority of women communicated with the navigator about more than one topic, with most message threads containing between 2 and 6 themes. This Figure depicts the multidimensional nature of the communication that took place between patients and the navigator, demonstrating that the majority of patients discussed multiple themes.

Table 1:

Cohort characteristics (N=218)

Characteristic	N (%) or mean (SD)
Age, years	28.9 (5.1)
Race/ethnicity	
Non-Hispanic black	108 (49.5%)
Hispanic	71 (32.6%)
Non-Hispanic white	28 (12.8%)
Asian	10 (4.6%)
Other	1 (0.5%)
Public insurance	218 (100%)
Married	67 (31%)
Primiparous	65 (29.8%)
Maternal-fetal medicine patient	81 (37.3%)
Total number of prenatal visits (excluding transfers of care)	9.4 (3.1)
Gestational age at birth, weeks	38.3 (3.1)
Returned for PP visit	192 (88.1%)
Time to PP visit (if returned), weeks	6.2 (1.2)
Phone plan with unlimited texting	211 (96.8%)
Preferred texting as mode of communication	201 (92.2%)
Contacted by...	
Texting	214 (98.2%)
Email	2 (0.9%)
Phone	2 (0.9%)

Table 2.

Communication categories and message themes

Category (purple) Corresponding message themes	Counts (%)	Example (N = navigator text, P = patient text)
Rapport-building (44.3%)		
Introductory	233 (12.5%)	"This is Nadia from the PAC Clinic" (N)
Supportive	247 (13.2%)	"Thank you for coming in! Keep in touch! ☺" (N) ; "It will take a while to adjust to have a baby around, but seems like you got this!"(N)
Social: Patient	251 (13.4%)	"I hope things are going well on your end" (N); "How did your interview go?" (N)
Social: Family	97 (5.2%)	"How's the baby? (N) "How did your daughter's dance recital go?" (N)
Postpartum Care Coordination (42.9%)		
Postpartum Appointment	687 (36.8%)	"Your appointment is all set for Wednesday at 2:45 pm at the PAC Clinic" (N)
Postpartum Purpose	15 (0.8%)	"They'll do a physical exam and check in about your health/ breastfeeding / birth control pills (if that's still your preference)" (N)
Postpartum Transportation	28 (1.5%)	"Do you have a ride?" (N)
Other Pregnancy-Related Appointment	71 (3.8%)	"The Dr. wants me to come for an appt [for a wound check]. Do you help me make that or should I call the office?" (P)
Maternal Health and Transitions (5.5%)		
Other Specialty Appointment	10 (0.5%)	"I actually have a sickle cell appt tomorrow. I need to reschedule the postpartum." (P)
Other Mental Health Appointment or Support	17 (0.9%)	"How are you feeling?" (N); "Take deep breaths and we'll figure something out." (N)
Health Insurance	13 (0.7%)	"It seems there's some issue with your Medicaid eligibility. Before we make an appointment...call the number on your card and check your medical coverage." (N)
Primary Care Provider	8 (0.4%)	"Do you have a primary care doctor? Do you want me to help you find one?" (N)
Contraception	56 (3.0%)	"Can you make me an appointment I had my IUD put in 2 weeks ago but I'm having some discomfort?" (P)
Motherhood (4.1%)		
Pediatrician	2 (0.2%)	"Have you been able to find a pediatrician yet?" (N)
Children	51 (2.7%)	"Today is best. Friday I have both my kids..." (P)
Maternity Leave	16 (0.9%)	"We will have the paperwork ready at your appointment" (N)
Breastfeeding	5 (0.3%)	"I'm having a hard time breastfeeding." (P); "Do you know where I can get breast pumps?" (P)
Study	60 (3.2%)	"Let me know when you get there, and I will go through a couple surveys with you" (N)

Table 3.

Occurrences of communication categories by postpartum return

Category	Total Frequency	Average number of counts per patient	
		Completed follow-up (N = 191)	Did not complete follow up (N = 25)
Rapport-building *	828 (44.3%)	4.0 (3.6)	2.6 (1.6)
Postpartum care coordination	801 (42.9%)	3.7 (2.5)	3.5 (2.7)
Maternal health and transitions *	104 (5.5%)	0.5 (1.4)	0.2 (0.4)
Motherhood	74 (4.1%)	0.4 (0.8)	0.2 (0.5)

* Indicates $p < 0.05$

Remaining 3.2% of themes were related to study follow-up and surveys.

Data displayed as N(%) or mean (SD).