

Original Research Article

Digital Support for Expectant Mothers: Expressed Experiences and Engagement in a WhatsApp Antenatal Group at a Nigerian Teaching Hospital

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Abstract: **Background:** While WhatsApp groups can be a tool to extend antenatal communication out of the clinic, regular digital contact does not necessarily indicate satisfaction or clinical efficacy. **Objective:** To describe the engagement patterns, verbalised experiences, perceived usefulness, supportive exchanges and challenges in a WhatsApp antenatal group linked to a hospital. **Methods:** This is a qualitative descriptive study where data was obtained through secondary analysis of textual data from the official Antenatal Support Group of the University of Port Harcourt Teaching Hospital, Nigeria, from 4th August 2022 to 25th August 2023. There were 679 unique sender labels in the corpus, and 12,409 messages. Relevance filtering and data cleaning resulted in 4,286 substantive messages being managed and analysed within NVivo by a multidisciplinary team using the six-phase thematic approach of Braun and Clarke. Message counts were not considered prevalence estimates for the participants, but descriptive features of the corpus. **Results:** Seven themes emerged: "visible engagement," "expressed appreciation and perceived usefulness," "access to antenatal information," "emotional reassurance," "peer learning," "linkage with facility-based care," and "challenges with platforms. The workbook included 339 messages that had to do with satisfaction, with 186 unique sender labels. These were indicators of text satisfaction rather than verified text satisfaction scores. No change in anxiety, attendance, or maternal outcomes were found in the data. **Conclusion:** The message corpus indicates that the moderated WhatsApp group could be a valuable auxiliary communication, reassurance and peer interaction channel during pregnancy. Further research is needed with validated measures and clinical outcomes to infer effectiveness.

Keywords: Antenatal Care, Digital Health, Maternal Health, mHealth, Qualitative Research, WhatsApp.

INTRODUCTION

Antenatal care offers the chance to detect risk, implement preventive measures, educate the mothers, prepare them for birth, and offer social support. The World Health Organization recommends a positive pregnancy experience that combines clinical care with respectful communication and relevant information [1]. In busy health facilities, however, overcrowding, long waiting times, and limited contact between visits may restrict continuity of communication [2].

Mobile health interventions can complement, but not supplant, facility-based antenatal care. In contexts where it is used for everyday communication, WhatsApp is highly relevant. Moderated groups have been employed in disseminating health information, answering concerns, offering peer interaction, and communicating with health care providers [3-5]. Although reviews highlight positive experiences of using maternal health digital interventions and telephone interventions

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[6-8], careful consideration should be made of issues of digital access, confidentiality, moderation, provider workload, and separating perceived benefits from measured health outcomes.

The formal antenatal WhatsApp support group at the University of Port Harcourt Teaching Hospital (UPTH) was set up as a virtual extension of the basic antenatal care. It captured questions and answers, peer exchanges, and some feedback to the service, as it happened naturally. These messages, however, do not allow direct measurement of satisfaction or psychological well-being or health behavior change, unlike a survey or interview. The general aim of this study was thus to investigate engagement patterns, reported experience, perceived usefulness, supportive exchanges, and challenges that were visible in the UPTH antenatal group on WhatsApp.

Conceptual Framework

The Technology Acceptance Model and Social Support Theory were used as sensitising, rather than deterministic, conceptual lenses. The Technology Acceptance Model (TAM) suggested that perceived usefulness and perceived ease of use were the factors that influenced technology acceptance [9], while Social Support Theory identified four types of support, namely informational, emotional, instrumental, and appraisal support [10], which were used to interpret the messages pertaining to convenience, usefulness, reassurance, shared experience, and provider guidance. Themes were largely inductive, that is, they were based on the message corpus as a whole and were not imposed on it.

METHODS

Study Design

This was a qualitative descriptive study that was based on secondary analysis of naturally occurring WhatsApp textual data. The unit of analysis was the individual message or a short sequence of messages needed to maintain the meaning.

Study Setting and Data Source

The setting was the official UPTH antenatal WhatsApp support group which complemented routine antenatal care through health education, clarification of pregnancy-related concerns, provider communication, and peer interaction. The data used for this study was the exported WhatsApp messages, containing message timestamps, anonymized sender category (antenatal group member or healthcare provider), and message text.

Observation Period

The cleaned message dataset covered 4 Aug 2022 to 25 Aug 2023, which is a 387-day observation period departmental classification by identifier identified 10 healthcare-provider accounts and 669 group-member accounts.

Participant-level factors such as age, parity, gestational age, educational level, and other factors were not included in the exported message corpus and were therefore not described. In addition, no WhatsApp view logs were available; thus, the passive observation of members who had not posted could not be measured.

Data Cleaning and Data Relevance Filtering

There was a total of 12,409 messages in the entire corpus. Exact duplicates, isolated greetings, stand-alone emojis, routine administrative notifications, and isolated acknowledgements that did not add meaning to an exchange were eliminated through data cleaning. Messages that did not contain clinical content but provided emotional support, a sense of belonging to a group, appreciation, dissatisfaction, or a challenge that related to the study purpose were retained. For thematic analysis, 4286 substantive messages (34.5% of the total text) were obtained after this process. "Data cleaning and relevance filtering" is the term used for the process, as this process is not purposive sampling but rather a complete available message export.

Data Analysis

The messages were analysed according to Braun and Clarke's six stages of thematic analysis: familiarisation, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report [11]. NVivo software for qualitative data analysis (Lumivero, Denver, CO, USA) was used during the stages to organise the corpus, apply initial codes, retrieve coded extracts, compare coding, and preserve the analytic record. The coding process was mostly inductive. When an individual post was ambiguous, there was examination of the context of the message, and those that were anonymised were used to exemplify the final themes.

Theme occurrence was only used to facilitate analytic transparency. This was not deemed statistically significant or participant-level prevalent, as one message could be coded more than once and one contributor could post more than one message.

Coding Team and Agreement:

The analytic team included five people, comprising three clinician-researchers and two clinical statisticians. An initial 10% of the analytic corpus was coded by two clinician-researchers who compared their code definitions and revised a combined codebook. They then coded the entire analytic corpus independently using NVivo. The coding differences were settled by consensus, and those which could not be reached were settled by the third (senior clinician-researcher). Data-cleaning outputs, numbers of words in the corpus, counts of senders for each label, and summaries of theme frequencies were checked by the clinical statisticians. A kappa statistic was not employed, as agreement was determined by iterative comparison and consensus and not as a fixed coding test.

Trustworthiness and Reflexivity

Independent coding, consensus review, examination of deviant or contradictory messages and maintaining conversational context were used to provide credibility to the extent that secondary textual data are applicable.^[12] The evolving codebook, NVivo coding history, reflexive memos, and a decision log of code merges, theme changes, and quotations selected supported dependability and confirmability. Clinician interpretation and independent verification of the counts at the corpus level by the clinical statisticians were used as analytic triangulation. Detailed reporting of the setting, observation period, corpus and platform characteristics supported transferability.

The team members were clinicians who were familiar with delivery of antenatal services, and reflexive notes were taken and discussion held about professional expectations that might lead to positive interpretation of the platform. Through theme development, negative experiences and unanswered questions have been intentionally kept, as were operational challenges. Saturation was not asserted because it was a bounded retrospective collection of data and not a prospective gathering of data until no data remained.

Ethical Considerations

Ethical approval was obtained from the University of Port Harcourt Teaching Hospital Research Ethics Committee (Ref: UPTH/ADM/90/S. II/VOL.XI/789, Date of Approval 20/09/2021). The secondary analysis included the retrospective use of archived group messages, which did not require further individual consent and was approved by the committee. This was made based on the use of existing records, minimal risk and de-identification prior to analysis. The analytic data file had personal identifiers removed and was not included in quotations.

RESULTS

Corpus Characteristics

The complete export amounted to 12,409 messages, of which 4,286 messages were retained after cleaning and relevance filtering. The messages were issued during the observation period as follows: 4,448 (August – October 2022); 2,189 (November 2022 – January 2023); 2,432 (February – April 2023); 2,725 (May – July 2023); and 615 (1 – 25 August 2023).

Table 1: Characteristics of the WhatsApp message corpus

Characteristic	Value
Complete message corpus	12,409 messages
Analytic corpus	4,286 substantive messages (34.5%)
Excluded during cleaning/filtering	8,123 messages (65.5%)
Available message fields	Timestamp, anonymised sender category, and message text
Observation period	4 August 2022 to 25 August 2023 (387 days)
Distinct active sender labels	679
Group-member sender labels	669, based on role-label classification
Provider/departmental sender labels	10, based on explicit titles or departmental identifiers
Messages without a sender value	31
Satisfaction-related signals	339 messages (7.9% of analytic corpus) from 186 distinct sender labels
Participant demographics	Not available in the exported message corpus
Passive readers	Not measurable because message-view logs were unavailable

Themes in the Message Corpus

Seven themes described the visible interactions and expressed experiences in the group. The themes and illustrative quotations are presented in Table 2. Quotations indicate what was expressed in the analysed messages; they are not survey responses or validated outcome measures.

Table 2: Themes and illustrative quotations from the analytic corpus

Theme	Description	Illustrative quotation
Variable visible engagement	Posting and message-reading practices varied, and contributors sometimes commented on whether others had read preceding messages.	"Probably they do not also read the messages to the end." (Group member)
Expressed appreciation and perceived usefulness	Messages included appreciation of provider responses and descriptions of the group as a convenient extension of clinic communication.	"Thank you for creating this platform for mothers to learn, relearn and unlearn things relating to pregnancy. I am glad to be here." (Group member)
Timely antenatal information	The group was used for health education and clarification of symptoms, nutrition, medicines, appointments, and clinic procedures.	"Headache is a danger sign in pregnancy... If the clinic is closed, please go to the labour ward." (Healthcare provider)
Emotional reassurance	Messages conveyed reassurance after explanations from providers or after reading similar experiences shared by peers.	"God bless you all, I am now relieved." (Group member)
Peer learning and shared experience	Members exchanged accounts of clinic visits, pregnancy symptoms, and practical experiences.	"Experienced the same thing, even worse... thank God I overcame." (Group member)
Linkage with facility-based antenatal care	Some messages referred to reminders, clinic attendance, or seeking in-person assessment after information shared in the group.	"Can I come to the hospital any other day? Please help me." (Group member)
Platform-related challenges	Challenges included high message volume, non-clinical traffic, and occasional delays in provider responses.	"My question has not been answered... I need clarifications." (Group member)

Narrative Description of Findings

There was some variation in the amount of visible engagement by contributors. Some messages were presented as questions, answers or shared experiences; other messages were related to reading group messages with very few posts. Since no view logs were exported, it was not possible to measure member engagement when there was no posting.

There were expressions of gratitude and perceived helpfulness in relation to provider explanations, convenience, and access to information between clinic visits. These expressions were characterized as statements of satisfaction within the text and not as a satisfaction measure.

Requests and response were included in the corpus for symptoms, nutrition, medication, appointments, and procedures in the clinic. There was also emotional reassurance and peer exchange in the messages. Some contributors associated group information to reminders and/or decisions to attend facility or to clinical outcomes, but the data did not allow for verification of attendance, adherence, reduced anxiety, or clinical outcomes.

Challenges relating to platforms were also raised. Participants reported challenges with volume of messages, distraction from non-clinical messages, and sometimes delays with provider response. These messages highlighted two practical issues for implementation – moderation and expectations of a response.

The dataset isolated 339 messages about satisfaction, which account for 7.9% of the messages in the analytic corpus (4,286) and 2.7% of the export. 186 different sender labels were related to these messages. This frequency refers to coded text expressions of things like thanks, relief, approval, or perceived usefulness, rather than the proportion of women who were satisfied, because contributors could post more than once and the denominator (full membership) was unavailable.

DISCUSSION

According to this analysis, the UPTH WhatsApp group was used as an additional communication arena where the members of the group communicated with health providers, other members and shared the good and challenges that they experienced in relation to their pregnancies. The results should be interpreted as trends across a set of messages, not as estimates of satisfaction or evidence of the effectiveness of intervention.

However, since WhatsApp view data were not available, passive participation could not be measured, as in moderated WhatsApp groups and in online health communities, level of participation is variable and "visible" posting is

just one form of participation.^[3,13,14] Claims made through continued posting or reading may indicate perceived value, but cannot replace validated technology acceptance or satisfaction measures.

Statements related to convenience, provider responsiveness, and useful information reflect the Technology Acceptance Model (TAM) constructs of perceived usefulness. Comparable maternal health studies have reported favourable acceptance of mobile messaging and telehealth interventions [4-15]. The present results contribute to this literature by providing insight into how perceived usefulness was communicated in conversations related to routine service. They do not demonstrate an effect on the platform on knowledge, attendance, or maternal outcomes.

The tone of messages that convey reassurance, shared experience and provider guidance connect with emotional and informational support. Reduced anxiety cannot be argued as an outcome of the study since the study did not involve a pre-post design or an anxiety scale, though statements about feeling calmer after an exchange are important signs of experience. This interpretation is consistent with Social Support Theory and with studies of moderated maternal groups and online communities [3-14].

Some messages addressed group information with reminders for clinic or seeking care. Similar digital maternal health programmes have reported potential effects on service engagement [7-16]. In this study, clinical outcomes and attendance was not associated with the WhatsApp data. Thus, the finding reflects a perceived or self-reported association with facility-based care and not necessarily a behaviour change.

Operational work to maintain digital support includes information overload, non-clinical traffic and delayed responses. Models of effective governance, privacy protocols, topic summaries, and an estimated workload for providers have been identified by other African WhatsApp studies to enhance usability and safety [8]. A moderated schedule, short topic summaries, guidance for escalation of urgent symptoms, and stated guidelines that the group is not meant to replace emergency or clinical assessment may improve safety and usability.

Implications for Practice and Research

Healthcare providers that are considering implementing WhatsApp groups for antenatal should establish the following: scope of the platform, moderator(s) roles, operating hours, response expectations, confidentiality guidelines, and emergency escalation pathway. Messages should not be used as a substitute for routine antenatal services. Alternatively, women without the ability to use cell phones, data, literacy education, or confidence in doing so will need alternative means of communication, and periodic summaries might limit the amount of information overload.

Future assessments should prospectively record group composition, demographics, exposure to the message, provider workload, and contributors' activity. For mixed method studies, measures of satisfaction, anxiety, knowledge and technology acceptance can be used in addition to message analysis. If possible, performance and maternal or neonatal outcomes should be compared and analyzed using suitable comparison groups and design that enables causal inferences.

Strengths and Limitations

One robust feature was the presence of a large, naturally occurring corpus of 12,409 messages from routine service delivery, thus maintaining the ecological context of digital antenatal communication. A total of 4286 substantive messages were analyzed to examine information exchange, support, perceived usefulness and implementation challenges.

The study also had some significant limitations. It was carried out in a single tertiary hospital and may not be applicable to other hospitals. This meant that women who did not have smart phones, data subscription, basic digital literacy or the desire to use WhatsApp were excluded or under-represented in the group. Participant demographics, verified exposure, and a denominator for active and passive engagement were not included in the message export. Multiple messages might be created by individual contributors, with multiple themes being possible in one message. Contextual cues may have been lost during data cleaning, but when such pieces of data conveyed meaning in the context of non-clinical information, they were preserved. Expressed appreciation and satisfaction measured with a validated instrument were not the same when dealing with the Internet. There were no pre-post measures or comparison group, no attendance linkage, and no maternal and neonatal outcomes. Last, the human nature of the group messages, social desirability, moderator involvement, and the inability of textual data to fully explain intent might affect the messages generated in a natural setting.

CONCLUSION

The UPTH antenatal WhatsApp message corpus indicates that a moderated group could serve as a helpful add-on to information and support given during pregnancy, clarifying information from providers, providing emotional support and exchange and providing peer exchange. It also uncovered some practical issues with the number of messages, off-topic messages, and reply times. The results suggest there is perceived usefulness and supportive potential, but not necessarily

better scores of satisfaction and anxiety, attendance or maternal outcomes. Effective and outcome-based assessments are needed to decide on effectiveness and to support sustainable implementation.

DECLARATIONS

Ethics Approval and Consent to Participate: This Study was approved by the University of Port Harcourt Teaching Hospital Research Ethics Committee with Ref: UPTH/ADM/90/S. II/VOL.XI/789 and Approval date: 20/09/2021. This is an approved retrospective secondary analysis, which involved de-identified archived messages and did not require further individual consent.

Consent for Reproduction: Not applicable. There is no presentation of identifying personal information.

Availability of Data and Materials: Data and materials are not publicly available due to the sensitive nature of the health-related messages in a closed WhatsApp group. The corresponding author can consider access, as long as it is reasonably and with respect to research ethics approval and privacy requirements.

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REFERENCES

1. World Health Organization. WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: World Health Organization; 2016.
2. Afulani PA, Phillips B, Aborigo RA, Moyer CA. Person-centred maternity care in low-income and middle-income countries: analysis of data from Kenya, Ghana, and India. *Lancet Glob Health*. 2019;7(1):e96-e109. doi:10.1016/S2214-109X(18)30403-0.
3. Patel SJ, Subbiah S, Jones R, Muigai F, Rothschild CW, Omwodo L, et al. Providing support to pregnant women and new mothers through moderated WhatsApp groups: a feasibility study. *mHealth*. 2018;4:14. doi:10.21037/mhealth.2018.04.05.
4. Omole O, Ijadunola MY, Olotu E, Omotoso O, Bello B, Awoniran O, et al. The effect of mobile phone short message service on maternal health in south-west Nigeria. *Int J Health Plann Manage*. 2018;33(1):155-170. doi:10.1002/hpm.2404.
5. Wali R, Alhakami A, Alsafari N. Evaluating the level of patient satisfaction with telehealth antenatal care during the COVID-19 pandemic at King Abdul-Aziz Medical City, Primary Health Care Center, Specialized Polyclinic. *Womens Health (Lond)*. 2022;18:17455057221104659. doi:10.1177/17455057221104659.
6. Mohamed H, Ismail A, Sutan R, Rahman RA, Juval K. A scoping review of digital technologies in antenatal care: recent progress and applications of digital technologies. *BMC Pregnancy Childbirth*. 2025;25(1):153. doi:10.1186/s12884-025-07209-8.
7. Nembot FD, Buh Nkum C, Ateudjieu D, Deborah K, Ebongo Nanje Z, Ndzana R, et al. Effectiveness of a WhatsApp-based communication on improving access to antenatal care interventions in sub-Saharan Africa: a randomized control health facility trial. *Digit Health*. 2025;11:20552076251379349. doi:10.1177/20552076251379349.
8. Dzomeku VM, Boamah Mensah AB, Nakua EK, Agbadi P, Okyere J, Kumah A, et al. Feasibility of the use of WhatsApp messaging technology to facilitate obstetric referrals in rural Ghana. *BMC Digit Health*. 2023;1:11. doi:10.1186/s44247-023-00012-5.
9. Davis FD. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q*. 1989;13(3):319-340. doi:10.2307/249008.
10. House JS. Work stress and social support. Reading (MA): Addison-Wesley; 1981.
11. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77-101. doi:10.1191/1478088706qp063oa.

12. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med*. 2014;89(9):1245-1251. doi:10.1097/ACM.0000000000000388.
13. Costello RE, Anand A, Jameson Evans M, Dixon WG. Associations between engagement with an online health community and changes in patient activation and health care utilization: longitudinal web-based survey. *J Med Internet Res*. 2019;21(8):e13477. doi:10.2196/13477.
14. Johansson V, Islind AS, Lindroth T, Angenete E, Gellerstedt M. Online communities as a driver for patient empowerment: systematic review. *J Med Internet Res*. 2021;23(2):e19910. doi:10.2196/19910.
15. Kante M, Malqvist M. Effectiveness of SMS-based interventions in enhancing antenatal care in developing countries: a systematic review. *BMJ Open*. 2025;15(2):e089671. doi:10.1136/bmjopen-2024-089671.
16. Mbunge E, Sibiya MN. Mobile health interventions for improving maternal and child health outcomes in South Africa: a systematic review. *Glob Health J*. 2024;8(3):103-112. doi:10.1016/j.glohj.2024.08.002.