

## Original Research Article

# A comparative study to assess utilization, awareness and perception on importance of mobile based application on pregnancy, birth and new-born care among rural and urban primi gravida mothers of Bellary district

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## ABSTRACT

**Background:** Pregnancy applications are more prevalent than other fitness and health applications. They also utilize immediate connection to seek expert advice and comfort. Recently, apps have emerged as a fresh method for delivering prenatal information that is easily available at the press of a button, for little to no money, at any time, and anywhere.

**Method:** A total of 50 rural and urban primi gravida mothers were included in the study. Utilization statements and knowledge questionnaire and opinionnaire-Likert scale on perception was used to collect data from sample.

**Results:** The majority of primi gravida mothers in rural areas, 15 (60%) expressed neutrality, 10 (40%) expressed dissatisfaction, in contrast, majority of primi gravida mothers in urban areas, 22, (88.0%) expressed neutrality, 3 (12.0%) expressed satisfaction. Majority of urban primi gravida mothers (20) had average knowledge and the remaining 5 (20%) had bad knowledge, the majority of 24 (96.0%) had poor knowledge and 1 (4%) had average knowledge, in contrast, the majority of rural primi mothers 20 out of 20 had unfavorable perceptions, with 60 (24%) having somewhat positive perceptions and the majority of 19 (76.0%) having unfavorable perceptions.

**Conclusions:** The results showed the urban primi gravida mothers were greatly utilizing mobile based application for maternal and foetal outcome, and rural mothers are not aware of mobile based application for maternal and health services and need to teach on mobile based application so that they utilize all governmental services and schemes.

**Keywords:** Primi gravida mothers, Utilization, Awareness, Perception, Mobile based application

## INTRODUCTION

Smart phones, including Android and iPhone models, are "a new technology integrating mobile phones and computing in a portable device". Users may complete a range of activities with only a single swipe of its keypad, from obtaining internet information to keeping in touch with individuals around the globe. The way healthcare is delivered is changing quickly. Smart phones are frequently used by people as their main method of accessing health information and as practical tools for managing their health. Smartphone users have access to a

variety of health programs (apps) with additional features like calculators and references. These applications may support healthy living, aid in self-care, and provide information access when and when it is needed. The marketplace for healthcare applications is expanding quickly as a result of these dynamics. In fact, the top app shops provide over 165,000 health apps.<sup>1</sup>

India is the country with the highest rate of newborn fatalities and accounts for one-fifth of all baby and maternal deaths worldwide. Nevertheless, India achieved significant strides: from 481 for 100,000 babies born alive

in 1990 to 99 in 2020, maternal death rates were lowered. A significant rise in institutional delivery, initiatives to raise educational attainment, and decreases in household poverty has all been linked to this improvement.<sup>2</sup>

Pregnancy applications are more prevalent than other fitness and health apps. Because they lack experience or want to share their knowledge with others, childbearing women frequently seek data about their upcoming or ongoing pregnancies. They also utilize immediate connection to seek expert advice and comfort. In recent years, apps have emerged as a brand-new method for making prenatal information easily available at the press of a button, for little to no money, at any time, and anywhere. As a consequence, there are more and more applications for pregnancy, childbirth, and childcare; at the moment, there are over 1,000 of these apps available in app stores.<sup>3</sup>

For pregnant women, the most crucial features of an app are its ability to should satisfy their demands and be reliable. Given that many of the applications now under development are not founded on scientific understanding of modern healthcare delivery, there is fear that their quality may suffer. Health experts must thus keep an eye on the accuracy of the information offered by maternity apps and pinpoint the requirements of pregnant women. However, no research has been done to yet to examine the effectiveness and user reviews of pregnant applications. As a result, we investigated the views of actual users about the use of applications for pregnancy, delivery, and paediatric care and examined the informational quality and content of these apps. Finding suitable pregnant applications and keeping an eye on their quality may be made easier with the aid of this study. It may also serve as a starting point for the creation of suitable apps catered to pregnant women's demands.<sup>4</sup>

Through warm, attentive listening, clinical, and laboratory examinations, prenatal consultations assist in handling and identification of clinical conditions, in addition to risky behavioural signs for the pregnant woman. This enables the professional to intervene early in order to avoid unfavorable outcomes in childbirth and birth. However, the attendance of expectant mothers at consultations, commitment to educational activities, and, most importantly, the training of professionals who handle the care of pregnant women are all directly tied to how well prenatal care is provided.

According to studies, socioeconomic conditions (low income for the family and education), mother's age (adolescence as well as older age), not residing with a partner, using alcohol or other drugs while pregnant, multiparty, refusing to accept pregnancy, availability of consultations (place where one lives far from the centre and cost of commuting), poor quality health care, a lack of family assistance, a negative social context, and negative experiences are the main causes of failure to provide prenatal care.<sup>5</sup>

Smart phones, including Android and iPhone models, are "a novel invention combining mobile phones and technology in a mobile device". Users may complete a range of activities with a single tap on its keypad, from obtaining internet information to keeping in touch with individuals across the world. The way healthcare is delivered is changing quickly. Smartphones are frequently used by people as their main method of accessing health information as well as practical tools for managing their health. Smartphone users have access to a wide variety of health programs (apps) with extra features like calculators and references.<sup>6</sup> These applications may support healthy living, aid in self-care, and provide information at your fingertips when and when it is needed. The market for applications in healthcare is expanding quickly as a result of these dynamics. In fact, the top app shops provide over 165,000 health apps.<sup>7</sup> As a consequence, there are more and more applications for pregnancy, childbirth, and childcare; at the moment, there are over 1,000 of these apps available in the app store.<sup>8</sup>

The present study was conducted assess utilization, awareness and perception on importance of mobile based application on pregnancy, birth and new-born care among rural and urban primi gravida mothers.

## METHODS

A quantitative research approach with non-experimental descriptive research design was used to conduct study. The populations for this study include the rural and urban primi gravida mothers of Bellary district. Non-probability purposive sampling technique. Sample comprised 50 (25 urban, 25 rural) primi gravida mothers from selected community area. The pilot study was conducted at selected rural and community areas of Bellary from 01<sup>st</sup> October 2023 to 19<sup>th</sup> January 2024 to find out the feasibility of the tool.

Formal administrative permission was obtained from the medical officer community health centre and rural and urban areas in Bellary urban area were selected by purposive sampling technique. 50 primi gravida mothers were selected by purposive e sampling technique. An informed consent was obtained from the primi gravida mothers. Tool used for data collection were demographic Performa, level of utilization, knowledge questioner and perception scale. By conducting pilot study conclusion were made tools and study design were found to be feasible. Based on the outcomes of the pilot study, the tool was further redefined.

### *Inclusion criteria*

Primi mother who are primi mother who are willing to participate in the study, primi mother who are cooperative, primi mother who are available throughout the study and primi mother without co morbid diseases were included in study.

### **Exclusion criteria**

Primi mother who are critically ill, primi mother who are had previous abortion, primi mother who are migrant form other district and primi mother whose expected date of delivery in next month were excluded.

### **Variables in the study**

*Research variable:* Utilization, awareness and perception on importance of mobile based application on pregnancy, birth and new-born care.

*Extraneous variable:* Personal characteristics such as age, religion, type of family residency, type of diet, previous information and sources of information.

## **RESULTS**

The present study was conducted to assess utilization, awareness and perception on importance of mobile based application on pregnancy, birth and new-born care among rural and urban primi gravida mothers.

### **Section I: socio-demographic variables of the studied primi gravida mothers**

Table 1 predict age higher percent of rural primi gravida mothers 15 (60%) were in 18-21 years and only 1 (4%) were in >31 years, whereas higher % of urban primi gravida mothers 9 (36%) were in 22-25 years and only 3 (12%) were in >31 years. Age at puberty higher percent of rural primi gravida mothers 10 (40%) were attended at 13 years and only 3 (12%) were attended at 11 years whereas higher % of urban primi gravida mothers 9 (36%) were attended at 13 years and only 4 (16%) were attended at 14 years of age. Gestational age higher percent of rural primi gravida mothers 13 (52%) were in 2<sup>nd</sup> trimester and only 5 (20%) were in 3<sup>rd</sup> trimester whereas higher percent of urban primi gravida mothers 16 (64%) were in 2<sup>nd</sup> trimester and only 2 (8%) were in 3<sup>rd</sup> trimester. History of contraceptive use higher percent of rural primi gravida mothers 11 (44%) were Never used and only 3 (12%) were using oral contraceptive whereas higher percent of urban primi gravida mothers 12 (48%) were using Condom and only 3 (12%) were using oral contraceptive. Source of information higher percent of rural primi gravida mothers 12 (48%) were had from mass media and only 3 (12%) were had from family members whereas higher percent of urban primi gravida mothers 11 (44%) were had information from mass media and only 3 (12%) were had from family members. Use any applications before higher percent of rural primi gravida mothers 25 (100%) whereas higher percent of urban primi gravida mothers 19 (76%) were no and only 1 (4%) were yes.

Application easy to use higher percent of rural primi gravida mothers 25 (100%) whereas higher percent of

urban primi gravida mothers 19 (76%) were Not used application and only 1 (4%) were yes. Got quality information higher percent of rural primi gravida mothers 25 (100%) whereas higher percent of urban primi gravida mothers 19 (76%) were Not used application and only 1 (4%) were no.

### **Section II: Utilization, knowledge and attitude of rural and urban primi gravida mothers regarding effective use of mobile based application for maternal and foetal outcome**

From Table 2 it is evident that utilization level of rural primi gravida mothers, majority 15 (60%) were Neutral and 10 (40%) were unsatisfied and none of the participants were satisfied where as in urban primi gravida mothers, majority 22 (88.0%) were neutral and 3 (12.0%) were satisfied and none of the participants were very unsatisfied and satisfied respectively.

From Table 3 is evident that knowledge level of rural primi gravida regarding effective use of mobile based application for maternal and foetal outcome majority 24 (96.0%) were had poor knowledge and 1 (4%) had average knowledge and none of the participants had good knowledge whereas urban primi gravida mothers majority 20 (80%) were had average Knowledge and 5 (20%) had poor knowledge and none of the participants had good knowledge.

From Table 4 it is evident that rural primi mothers in effective use of mobile based application for maternal and foetal outcome majority 19 (76.0%) were had unfavorable perception and 6 (24%) had moderately favorable perception and none of participants had favorable perception, whereas rural primi mothers majority 20 (80%) were had unfavorable perception and 5 (20%) had moderately favorable perception and none of participants had favorable perception.

From Table 5 the utilization scores of rural primi gravida mothers regarding effective use of mobile based application for maternal and fetal outcome was 41.21 with 39.56 mean score and 6.397 standard deviation and urban primi gravida had 54.04 with 51.88 mean score and 5.333 standard deviation in pilot study.

From Table 6 the awareness of rural primi gravida mothers regarding effective use of mobile based application for maternal and fetal outcome was 35.41 with 9.56 mean score and 2.36 standard deviation and urban primi gravida had 56.15 with 15.16 mean score and 2.03 standard deviation in pilot study. From Table 7 the perception of rural primi gravida mothers regarding effective use of mobile based application for maternal and fetal outcome was 22 with 22.16 mean score and 3.705 standard deviation and urban primi gravida had 32 with 31.76 mean score and 6.126 standard deviation in pilot study.

**Table 1: Demographic characteristics.**

Variables	Rural subjects		Urban subjects	
	N	%	N	%
<b>Age (in years)</b>				
18-21	15	60.0	6	24.0
22-25	5	20.0	9	36.0
26-30	4	16.0	7	28.0
>31	1	4.0	3	12.0
<b>Age at puberty (in years)</b>				
11	4	16.0	4	16.0
12	5	20.0	5	20.0
13	10	40.0	9	36.0
14	3	12.0	3	12.0
15	3	12.0	4	16.0
<b>Gestational age</b>				
1 <sup>st</sup> trimester	7	28.0	7	28.0
2 <sup>nd</sup> trimester	13	52.0	16	64.0
3 <sup>rd</sup> trimester	5	20.0	2	8.0
<b>History of contraceptive use</b>				
Never used	11	44.0	5	20.0
Condom	6	24.0	12	48.0
Intra uterine device	5	20.0	5	20.0
Oral contraceptive	3	12.0	3	12.0
<b>Source of information</b>				
Mass media	12	48.0	11	44.0
Peers/friends	5	20.0	3	12.0
Family members	3	12.0	5	20.0
Health personnel	5	20.0	6	24.0
<b>Use of apps before</b>				
No	25	100.0	6	24.0
Yes	0	0.0	19	76.0
<b>App easy to use</b>				
Not used	25	100.0	19	76.0
Yes	0	0.0	1	4.0
No	0	0.0	5	20.0
<b>Get quality information</b>				
Not used	25	100.0	19	76.0
Yes	0	0.0	5	20.0
No	0	0.0	1	4.0

**Table 2: Utilization level of primigravida mothers in rural and urban areas.**

Level of utilization	Rural subjects		Urban subjects	
	N	%	N	%
<b>Unsatisfied</b>	10	40.0	0	0.0
<b>Neutral</b>	15	60.0	22	88.0
<b>Satisfied</b>	0	0.0	3	12.0
<b>Total</b>	25	100.0	25	100.0

**Table 3: Knowledge level of primigravida mothers in rural and urban areas.**

Level of knowledge	Rural		Urban	
	N	%	N	%
<b>Poor knowledge</b>	24	96.0	5	20.0
<b>Average knowledge</b>	1	4.0	20	80.0
<b>Good knowledge</b>	0	0.0	0	0.0
<b>Total</b>	25	100.0	25	100.0

**Table 4: Perception level of primigravida mothers in rural and urban areas.**

Level of perception	Rural		Urban	
	N	%	N	%
Unfavorable perception	19	76.0	20	80.0
Moderately favorable perception	6	24.0	5	20.0
Favorable perception	0	0.0	0	0.0
Total	25	100	25	100

**Table 5: Mean, mean percent and Standard deviation of utilization scores of primi gravida mothers in rural and urban areas.**

Utilization items	No. of items	Max score	Rural			Urban		
			Mean	%	SD	Mean	%	SD
Utilization of mobile during antenatal period	8	24	9.16	38.17	2.427	14.28	59.50	2.716
Utilization of family planning services	6	18	6.68	37.11	2.056	9.48	52.67	2.312
Utilization of postnatal care services	10	30	12.92	43.07	3.027	17.24	57.47	3.491
Utilization of post abortion care services	3	9	4.88	54.22	1.301	3.88	43.11	1.424
Utilization of STI/ HIV/ AIDS control services	5	15	5.92	39.47	1.801	7	46.67	2.236
Overall	32	96	39.56	41.21	6.397	51.88	54.04	5.333

**Table 6: Mean, mean percent and standard deviation of knowledge scores of primi gravida mothers in rural and urban.**

Groups	No. of items	Max score	Rural			Urban		
			Mean	%	SD	Mean	%	SD
General information on the mobile based application	8	8	2.96	37.00	1.207	4.32	54.00	1.069
Mother and child tracking system	10	10	4.32	43.20	1.145	6.12	61.20	1.092
Benefits of mobile based application in maternal and the child health services	9	9	2.28	25.33	1.882	4.72	52.44	1.487
Overall	27	27	9.56	35.41	2.364	15.16	56.15	2.035

**Table 7: Mean, mean percent and standard deviation of attitude scores of primi gravida mothers in rural urban areas.**

Perception	No. of items	Max score	Rural			Urban		
			Mean	%	SD	Mean	%	SD
General information of Mobile based application	5	20	5.48	5	2.104	8.72	8	3.195
Mother and child tracking system	4	16	5.08	5	2.12	7.44	8	1.981
Benefits of mobile based application	9	36	11.6	12	2.398	15.6	16	4.153
Overall	18	72	22.16	22	3.705	31.76	32	6.126

### Section III: comparison of utilization, knowledge and attitude of rural and urban primi gravida mothers regarding effective use of mobile based application for maternal and foetal outcome

From Table 8 the mean rural subject's overall utilization scores 39.56 with SD of 6.3, whereas the mean urban

subject's utilization scores were 51.88 with SD of 5.33 and the mean enhancement was 12.32.

The obtained "t" value was 6.964 which were better than the slab value indicating that there was a significant disparity between rural and urban mother's utilization scores in the pilot study.



From Table 9 the mean rural subject’s overall mean knowledge scores 9.56 with SD of 2.36, whereas the mean urban subject’s knowledge scores were 15.16 with SD of 2.035 and the mean enhancement was 5.6.

The obtained “t” value was 8.8134 which were better than the slab value indicating that there was a significant disparity between rural and urban mother’s knowledge scores in pilot study.

From Table 10 the mean rural subject’s overall mean perception scores 22.16 with standard deviation of the 3.705, whereas the mean urban subject’s perception scores were 31.76 with standard deviation of the 6.126 and the mean enhancement was 9.6. The obtained “t” value was 6.288 which were better than the slab value indicating that there was a significant disparity between rural and urban mother’s perception scores in the pilot study.

**Table 8: Comparison of utilization scores of primi gravida mothers in Rural and urban areas.**

Groups	Rural		Urban		Mean difference	T value	Df	Inference
	Mean	SD	Mean	SD				
Utilization of mobile during antenatal period	9.16	2.427	14.28	2.716	5.12	6.599	48	S
Utilization of family planning services	6.68	2.056	9.48	2.312	2.8	4.291	48	S
Utilization of postnatal care services	12.92	3.027	17.24	3.491	4.32	4.385	48	S
Utilization of post abortion care services	4.88	1.301	3.88	1.424	1	2.700	48	S
Utilization of STI/HIV/AIDS control services	5.92	1.801	7	2.236	1.08	1.958	48	NS
<b>Overall</b>	<b>39.56</b>	<b>6.397</b>	<b>51.88</b>	<b>5.333</b>	<b>12.32</b>	<b>6.964</b>	<b>48</b>	<b>S</b>

**Table 9: Comparison of knowledge scores of primi gravida mothers in rural and urban areas.**

Groups	Rural		Urban		Mean difference	T value	Df	Inference
	Mean	SD	Mean	SD				
General information	2.96	1.207	4.32	1.069	1.36	4.013	48	S
Mother and the child tracking system	4.32	1.145	6.12	1.092	1.8	5.578	48	S
Benefits of mobile based application in maternal and child health services	2.28	1.882	4.72	1.487	2.44	5.157	48	S
<b>Overall</b>	<b>9.56</b>	<b>2.364</b>	<b>15.16</b>	<b>2.035</b>	<b>5.6</b>	<b>8.813</b>	<b>48</b>	<b>S</b>

**Table 10: Comparison of perception scores of primi gravida mothers in rural and urban areas.**

Groups	Rural		Urban		Mean difference	T value	Df	Inference
	Mean	SD	Mean	SD				
General information of mobile based application	5.48	2.104	8.72	3.195	3.24	3.851	48	S
Mother and child tracking system	5.08	2.12	7.44	1.981	2.36	3.692	48	S
Benefits of mobile based application	11.6	2.398	15.6	4.153	4	4.104	48	S
<b>Overall</b>	<b>22.16</b>	<b>3.705</b>	<b>31.76</b>	<b>6.126</b>	<b>9.6</b>	<b>6.288</b>	<b>48</b>	<b>S</b>

**DISCUSSION**

The utilization level of rural primi gravida mothers, majority 15 (60%) were neutral and 10 (40%) were unsatisfied and none of the participants were satisfied where as in urban primi gravida mothers, majority 22 (88.0%) were neutral and 3 (12.0%) were satisfied and none of the participants were very unsatisfied and satisfied respectively. knowledge level of rural primi

gravida regarding effective use of mobile based application for maternal and foetal outcome majority 24 (96.0%) were had poor knowledge and 1 (4%) had average knowledge and none of the participants had good knowledge whereas urban primi gravida mother’s majority 20 (80%) were had average knowledge and 5 (20%) had poor knowledge and none of the participants had good knowledge. use of mobile based application for maternal and foetal outcome majority 19 (76.0%) were

had Unfavorable perception and 6 (24%) had moderately favorable perception and none of participants had favorable perception, whereas rural primi mother's majority 20 (80%) were had unfavorable perception and 5 (20%) had moderately favorable perception and none of participants had favorable perception.

The research's findings corroborated those of Mahajan and Sharma who examined how primi gravida females in urban and rural India used maternal and child health services.<sup>9</sup> The study's findings indicate that both urban and rural regions have low rates of utilization of maternity and child health care (MCH) services. Given that maternal health issues in India are mostly caused by ignorance, poverty, and a lack of awareness of the issue, women's health awareness has a unique relevance. It is crucial to first concentrate on services for the mother's rising level of consciousness.

The quality, accessibility, and utilization of maternal health care services provided by government agencies in both rural and urban areas will be sustained and improved with the aid of a focused and long-lasting IEC campaign to raise community awareness of MCH. The second objective was to determine how well-informed rural and urban primi gravida moms were about using mobile applications for pregnancy, labour and new-born care. The study's conclusions corroborated those of Chaudhary et al who wrote in effect about a social media-based health awareness program on postnatal care (PNC) information among pregnant women employing smart phones in Dhulikhel hospital: a controlled study that social media-based wellness education is effective in raising pregnant women's PNC knowledge scores.<sup>10</sup> To determine if this improved awareness results in a rise in PNC care use, more investigation is required. The results of the study were consistent with those of Lee and Moon who conducted research to determine the utilization and content evaluation of mobile applications for pregnancy, birth, and child care.<sup>11</sup>

The findings demonstrated that pregnant women now rely heavily on applications linked to childbirth, pregnancy, and child care as a source of knowledge. Credible applications for pregnancy, childbirth, and child care should be created and maintained by trained healthcare experts in order to meet user demands. The results of this study were consistent with those of Lazarus et al study from 2022, effects of self-perineal maintenance education using a mobile application on knowledge and performance of perineal care among primigravida mothers: a quasi-experimental study.

The study's finding showed that SPC education given to primi gravida mothers as early as the prenatal stage significantly increased their knowledge and helped them perform adequate postpartum perineal care. Less pain and better wound healing outcomes are benefits of good SPC practice. Using the smartphone app to self-report gives new mothers more control over their health and

encourages them to participate in self-care. This is consistent with the modern healthcare idea that promotes patient involvement.

It is intended that this study would open nurses' eyes and inspire them to establish a comparable SPCE program as early as the pregnant stage in order to increase primipara moms' awareness and promote excellent SPC practice, which will enhance early maternal-child bonding. The research's findings were consistent with those of Rongmei, who performed a study to evaluate the impact of a structured teaching program on postpartum mothers' care in a hospital in Azamgarh.<sup>12</sup> Prior to the implementation of a structured training module, the majority of postnatal mothers had knowledge of kangaroo mother care that was on average 50% (15), 16.66% of which was excellent, and 33.33% (10) of which was bad. Following the implementation of the teaching module, the majority of postpartum moms had high knowledge of kangaroo mother care (53.3%), while 46.6% had moderate knowledge and none had poor knowledge. It was determined that organized education programs are an efficient way to boost postnatal moms' awareness of kangaroo mother care.

### **Limitations**

The study assessed on knowledge and perception by knowledge questionnaire and Likert scale only, but practice scores was not assessed on utilization of importance of mobile based application on pregnancy, birth and new-born care. The study was restricted only to the primi gravida mothers in the selected rural and urban areas of Bellary, and in one part of the population. The report was unable to analyze the additional factors that lead to un satisfaction of utilization of importance of mobile based application on pregnancy, birth and new-born care. Random sampling technique was not adopted in selecting sample. As study sample were primi gravida mother's research scholar had difficulty in gaining their attention during data collection.

### **CONCLUSION**

The present study concludes that the utilization, awareness and perception on importance of mobile based application on pregnancy, birth and new-born care among rural and urban primi gravida mothers and results showed the urban primi gravida mothers were greatly utilized than rural primi gravida mothers regarding mobile based application for maternal and foetal outcome, and rural mothers are not aware of mobile based application in relation maternal and health services and need to teach on mobile based application so that they utilize all governmental services and schemes.

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