Findings, Discussion and Conclusion
CHAPTER V
FINDINGS, DISCUSSION AND CONCLUSION

5.1 Findings of the study

1. As a reason for instituting the intervention (knowledge dissemination), there is substantive increase in the ‘knowledge’ level of the expectant mothers between ‘pre intervention’ and the ‘post intervention’ on various aspects of antenatal care. It is understood that the intervention of health messages sent has effectively enriched the awareness level of the expectant mothers.

2. The expectant mothers are found to possess a moderate ‘knowledge’ of antenatal care prior to the intervention and this level of awareness was prevalent alike across all age groups. Inadequate access and dissemination of information from the varied sources of health information has led to the restricted knowledge of the expectant mothers.

3. Possession and access to mobile phones is a post marriage phenomenon for most of the women from low socio-demographic profile. This can be attributed to the reason of accessing healthcare during their pregnancy which eventuated in the apparent increase of awareness on antenatal care through the mobile text messages.

4. Pregnancy period is a very important and crucial one in the lives of any woman, whichever age group she may belong to. Antenatal care messages through mobile phones have emulated high outcome expectations among expectant mothers similarly across all age groups.

5. The expectant mothers of different age groups are found to hold differing views on ‘effort expectancy’ to use mobile phones for accessing health services. It can be surmised that the period of exposure and practice in using the technology comes with age and that creates the difference in the perceptions of the expectant mothers.
6. Variances are found in the outlook on what constitutes as essential ‘facilitating conditions’ for the use of mobile phones based on the age group the expectant mother belongs to. Knowledge of what conditions can be constituted to be facilitating for the usage of mobile phones comes with age and also the experience in the use of mobile phones. The younger age group is found to be the comparatively new users than the older age group and that validates the difference.

7. The ability to operate the various functions of mobile phones remains alike among the expectant mothers across all age groups. Hence the views on ‘self efficacy’ for the usage of mobile phones for accessing health services are also found indistinguishable.

8. The antenatal care is a vital aspect during the pregnancy period of a woman. Their orientation to seek advice and reinforcement for a safe pregnancy from any source or means remains identical and this reflects on the similarities found in the attitude of the expectant mothers across all ages.

9. Between the pre intervention and post intervention, the intervention of health messages has been fruitful and emanated an increase in awareness on antenatal care among the expectant mothers irrespective of their education background.

10. The difference in the education level of the expectant mothers did not mirror on their reflections on ‘performance expectancy’ from using mobile phones for accessing health care services. The outcome of health interventions remains the same regardless of the educational advancement they have undergone and hence the outcome expectations on m Health also remains alike.

11. The ‘effort expectancy’ of the expectant mothers is found indistinguishable between different levels of education. Usage of mobile phones is so prevalent across all segments of the populace that everyone is capable of operating the various functions of mobile phones regardless of their education.

12. The social outlook on the health of a pregnant woman is considered vital across all segments of the populace irrespective of the background of the pregnant woman. Hence the perception of social influence on their use of mobile phones for m Health did not vary with the educational background of the expectant mothers.
13. Education does not create any differential presence of the ‘facilitating conditions’ to use mobile phones for health care services and hence was discerned in the same manner by the expectant mothers of different educational background.

14. The ‘behavioural intention’ to use the m Health interventions remains alike among the expectant mothers with differing educational background. More than education, the intention to use m Health arises out of their interest in availing the various areas of m Health.

15. The efficiency to use the various features of mobile phones is found to be prevalent in the same manner among the expectant mothers at all levels of education and hence resulted in similar assumptions of ‘self efficacy’ to use mobile phones for accessing health services.

16. The probability is that with diverse source of information for accessing healthcare, the expectant mothers with higher educational background tend to show a lighter inclination towards m Health and hence created the differences in the attitude towards m Health among expectant mothers of different education levels.

17. Guidance for pregnancy period emulates on similar grounds from the various sources of health information for expectant mothers from both nuclear family and joint family that resulted in an equivalent pre-intervention awareness and post intervention increase in awareness on antenatal care.

18. The felt need for health information on antenatal care as a reinforcement for their existing awareness is identical among expectant mothers from nuclear as well as joint family which drives to their unified views on ‘performance expectancy’ from m Health messages.

19. The expectant mothers from joint family are found to consider ‘effort expectancy’ on a higher scale in comparison to those from nuclear family. The need for convincing the family members and finding a space to access m Health falls as an extra feat for the expectant mothers from joint family.
20. On the other hand, the ‘social influence’ in accessing health services through mobile phones is found to be higher for the expectant mothers from nuclear family. It can be inferred that to surmount the absence of continued presence and guidance of family members, the expectant mothers of nuclear family tend to seek advice and consult with other sources of health information more than those from the joint family.

21. The ‘facilitating conditions’ essential to use mobile phones for health services is an external factor that does not correlate with the type of family set up and hence the expectant mothers from both nuclear and joint family tend to seek facilitating conditions on similar grounds.

22. The expectant mothers from both nuclear and joint family are found to express similar ‘behavioural intention’ to use mobile phones for accessing health services as their intentions are driven by similar needs of safe and secure pregnancy.

23. The ability to operate various functions of mobile phones was found to be on indistinguishable levels among the expectant mothers of both nuclear family and joint family. This emulated an identical viewpoint amongst all the expectant mothers on their ‘self efficacy’ to use m Health.

24. The need for an extra indulging supply of antenatal care messages is perceived to be alluring by expectant mothers from nuclear as well as joint family which infuse a similar ‘attitude’ to use mobile phones for accessing health services.

25. The conventionally long drawn and complex process of communication within the health system hierarchy has become more simplified and convenient for all the stakeholders, resulting in a convalescent health communication.

26. The expectant mothers across different age groups, levels of education and type of family set up are found to be new users of mobile phones with most of them using it for just 1 to 2 years. It is inferred that the reasons could be either for being accessible for the sake of maternal healthcare or getting access to mobile phones only after marriage.
27. In spite of being new users majority of the expectant mothers are found skillful to operate the various functions of mobile phones regardless of their age, educational background or type of family set up.

28. The preferred mode of delivery of health communication for the expectant mothers in the study was text messages as they had a basic educational background to comprehend the text messages. In addition, they feel that the text messages could be read in private, at their own convenience and be available for further reference.

29. The expectant mothers expressed an overwhelming response on the usefulness of the antenatal care messages shared with them to the extent of requesting for post natal care messages and on other health conditions too.

5.2 Discussion

Dissemination of Essential Knowledge

The study primarily tested the efficacy of mobile phones in creating essential knowledge for antenatal care among the expectant mothers. The striking result shows that the intervention of antenatal care messages has created a highly significant influence in the increase of knowledge level of the expectant mothers. The expectant mothers with the existing basic level of awareness on antenatal care have shown great enthusiasm in accepting a novel and convenient way of accessing antenatal care messages that increased their knowledge level. Text messages being more direct, asynchronous and available at all times, has been internalized more readily and strongly.

Performance Expectancy

Performance expectancy is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance. The perceived usefulness or relative advantage or the outcome expectations are found to be most significant and influential factor for intention to use in both voluntary and mandatory settings and also at all points of usage (Ventakesh et al., 2003).

Access to health information and counseling through mobile phones is a completely voluntary setting and the respondents are at their own liberty to access it or
ignore it. Moreover receiving health information does not attribute to stages of usage as the need for good health exists throughout the life of an individual. Hence, accessing health information through mobile phones provides a new dimension in the study of technology acceptance and usage.

In consonance with the study of Chib et al., 2013, the respondents felt that the mobile phones enable them to easy access of information on pregnancy and antenatal care. In addition, the mobile phone messages on antenatal care created an awareness of complications during pregnancy and also emphasized the need for birth preparedness. Indian women, especially the rural women are ignorant of complications arising during their pregnancy period and also highly negligent on issues of birth preparedness including availing a health facility for delivery, saving money for emergency, and also identifying a blood donor in times of emergency. When such issues are reemphasized through the text messages they find it highly useful.

Most of the respondents felt that the intervention text messages reinstated the importance of medication adherence and this was confirmed by the interviewees of the qualitative study. In the words of an interviewee, “The antenatal care messages sent through mobile phones have been truly informative and it made me realize the importance of taking the medicines regularly for a healthy pregnancy period. Now I am taking my iron and folic acid supplements without fail”. As the text messages were conveying the difficulties that may arise if the supplements are not taken regularly, the respondents realized the importance of IFA supplements.

The respondents are also of the opinion that at times of emergency and other critical conditions they are able to connect to the health workers or the doctors at any point of time, which is identical to the findings of the studies by Huq et al., 2014 and Bali & Singh, 2006. When people are residing away from the health facility and also proper transport facility, mobile phones are greatly helpful in communicating to the required health personnel.

The findings of the studies by Chib et al., 2012; Crentsil, 2014 & Praveen et al., 2014 revealed that mobile phones enable people to contact the doctors directly and thereby save their travelling time and waiting time to see the doctor. Whilst majority of the
respondents of this study are not supportive of this opinion and felt that though contacting doctors or health workers through mobile phones save their travelling time, it is not as effective as meeting the doctor in person. The physical presence of the doctor makes them confident of the situation and thereby gives a psychological boost to their morale.

The results of the in-depth interviews confirm the findings of many of the review studies. Through the interviews with the Doctors it is understood that they are able to contact and orient their staff at hospitals for treatment of the patients at times of emergency, when they are away from hospitals and are held up in meetings or other works as told in the study by Chang et al., 2014.

It can be surmised that the Doctors working in the Primary Health Centers will need to go for field visits as well as attend periodical meetings with the health officials. As a person of responsibility of the health of every individual in their area, doctors feel a great relief for being able to be connected through mobile phones and be informed of the conditions of their patients. More importantly, they are able to keep the patients in good condition till they are able to see them in person.

In addition, the doctors are found to be contacting their patients with chronic diseases over mobile phones for post consultation counseling and medication adherence as cited in Crentsil, 2014 & Batra et al., 2011.

As has been mentioned, the medical officers/doctors of the Primary Health Center are held responsible for the health condition in their assigned area. Though they are able to reach out to patients with chronic diseases for consultation through field visits, medication adherence and treatment adherence is still a challenge for them. However, continuous counseling through mobile phones enables them take a step forward towards such arduous tasks.

At times of emergency disease conditions, the doctors find mobile phones to be helpful in updating the field reports instantly to the health officials. The periodical reports of the health status are also updated through mobile phones. The medical officers/Doctors are also in charge of sending periodical and sometimes daily reports of the health data to the Central Server and with the mobile phones, they are able to do it instantly without much delay.
In short, the doctors feel that the communication gap that exists among the health care hierarchy has totally vanished with the advent of mobile phones.

The interviews with the Village Health Nurses and the patients as well revealed that with the help of mobile phones they are now able to handle emergency situations efficiently as they are now able to contact the referral centers and also arrange for transport services within a short span of time, which is in line with the findings of the studies of Huq et al., 2014 & Nquimfack et al., 2012.

It was also found that the VHNs are able to send instant field reports of the prevalent disease conditions to the higher authorities along with the routine reports through mobile phones which reiterate the findings of the review studies Mendoza et al., 2014; Mangilima et al., 2010 & Ganesan et al, 2010.

According to majority of the VHNs, mobile phones have enabled anytime communication within the healthcare infrastructure and have reduced the existing protocols in communication as also found in the study by Mendoza et al., 2014. A major concern of the VHNs, the time and effort to contact the patients in remote areas for routine visits is reduced to a great extent as they are now able to counsel them over mobile phones. This was the case in the study by Crentsil, 2014.

The post natal period of the women is the most concerning segment of the women’s health. With the registration details, the VHNs are now able to contact the post natal mothers and follow up with their health as has been found in the studies US Department of Health, 2015; UNICEF, Health Section, 2013; and Philbrick et al., 2013.

According to the VHNs, Mobile phones are found to be helpful in several other ways including tracking the patients and contacting them for several purposes including medication adherence, vaccination reminders, receipt of monetary scheme benefits. Similar conditions are found in the studies by Chang et al., 2014; Crentsil, 2014; Huq et al., 2014; Wakhadha et al., 2013 & Batra et al., 2011.

The statistical analysis of the quantitative data reveals that there exist no significant differences in terms of age, education and type of family set up of the respondents and their perception on the usefulness of the usage of mobile phones for accessing health services.
In an Indian society, the pregnant women are always considered with utmost care and hence whatever information shared or services offered through mobile phones will act only as a strengthening element. With the anxiety of pregnancy existing among the women of all ages, their expectations on the outcome of the usage of mobile phones for antenatal care remains the same.

Similarly, education of the respondents does not qualify them for a safe pregnancy. Their needs and expectations for a safe pregnancy remains the same. Mobile phones usage and proficiency in handling the mobile phones are found universal across all segments of people. With this background, it is clear that education may not create significant differences in their outlook towards the benefits of using mobile phones for accessing antenatal care services.

Though the statistical differences are not high to be significant between respondents from joint family or nuclear family, respondents from joint family show a higher expectation score on what they need out of usage of mobile phones for health services. Respondents in joint family will receive support and counseling from different quarters of their family and if mobile phones have to be used for health services, it will definitely be on a higher scale which is reflected in the study results (Mdn = 100.71) too.

Based on the above observations, the expected and experienced usefulness of mobile phones seems to be high for all segments of the health care system.

**Effort Expectancy**

Effort expectancy is defined as the degree of ease associated with the use of the system (Venkatesh et al., 2003). Ease of use of the system can be interpreted in various ways including complexity associated with the use of the system. In this case, ease of use will be associated to the ease of use of mobile phones and also the ease of use in accessing services through the mobile application.

It should also be noted that the effort expectancy construct will play a significant role in the adoption of the system mostly during the introduction of the system, in this case accessing health information through text messages. Hence this construct is valid to
the level that how far the respondents are able to operate the mobile phones to access the texts messages and as well as the level of comprehension of the information present it the messages.

At the basic level, the majority of the respondents felt that the mobile phones are easy to operate and there is no requirement of special skills to operate the phones. In the qualitative interviews with the health workers, they expressed that they find it easy and convenient to enter the field report data and send it to their higher officials. This response supports the findings of the review studies (Diwan et al., 2015; Udedi, 2014; Van Heerden, et al., 2013; Mendoza et al., 2014 and Gow & Waidyanatha, 2010) where data entry and reporting was done by the health workers using mobile applications. With the widespread acceptance and usage of mobile applications for data entry and reporting by the health workers of various countries, it is essential for the Indian Government to wake up to the situation and provide the necessary infrastructure for the practice of mobile data management.

When it comes to dissemination of health services through the mobile phones, the ease of comprehension of the messages or the system to access the services is also essential. In this case, the text messages consisted of the antenatal care messages that will be helpful for safe pregnancy period. It can be understood from the quantitative study that majority of the respondents were of the opinion that as the messages came in Tamil, they could understand the messages. And more importantly, the content of the messages were simple to comprehend and put to practice. According to one of the interviewee, “We have been receiving antenatal care messages through MCTS portal. That was in English and hence we could not read those messages. These messages which I have been receiving for the past one month is in Tamil, that makes me feel comfortable and I am able to understand it better.” A similar situation of sms messages in English impeding the women from reading and understanding the quizzes is seen in the study by Apunyu, 2011. Identical finding was found in the study by Medhi et al., 2012, where the health workers found it easy to enter data with Hindi texts in their mobile phones. Ease of using a system comes with the familiarity of the language in which the users can better comprehend with.
The statistical evidences from the current study shows significant differences among respondents of different age groups towards their attitude for using mobile phones for the purpose of accessing health services. It can be seen that age undeniably plays a major role in how a technology and its usage is looked at. The younger age group is born into a technology world and will find it easy to acclimatize to the use of technology in their day to day activities. The study project that there is a difference in the way each age group perceives at the level of effort required to access health messages through mobile phones. This is in line with the findings of the studies of Jager & Belle, 2014; Miller & Himelhoch, 2013 & Huang et al., 2013.

The respondents of all education level tend to look at the effort required to operate mobile phones and accessing health messages through it more or less in a similar way. To the surprise, it is found that the respondents with post graduate level are expressing of more efforts required for this purpose.

The independence and confidence with which women approach any life skills including usage of mobile phones do differ based on the type of family they belong to. Hence we find that women from joint family and women from nuclear family hold differing perceptions of efforts required for using mobile phones for their health needs.

**Social Influence**

Social influence is defined as the degree to which an individual perceives that important others believe he or she should use the new system (Venkatesh et al., 2003). An individual’s behavior towards the use of technology may be influenced by the way in which he believes that others will reflect on him as a result of using the technology. It is important to note that Social Influence has very little effect in voluntary settings, except in influencing perceptions about the technology.

Social influence has an impact on individual behavior through three mechanisms: compliance, internalization, and identification. While the latter two relate to altering an individual’s belief structure and/or causing an individual to respond to potential social status gains, the compliance mechanism causes an individual to simply alter his or her intention in response to the social pressure—i.e., the individual intends to comply with the social influence.
The present study context is a unique situation, where the behavior towards the usage of technology affects the individual directly on their health condition. In addition, the Indian society is a socially bound one, where intricate and complex social structure exists. Hence the role of Social Influence construct in the usage of mobile phones for health purposes will evolve into a totally new facet.

It can be understood that mobile phones have become a part of social existence and no more considered as a luxury or a status symbol, as only half of the respondents did consider the ownership of mobile phones as a symbol of status. This is a supporting factor for the efforts of disseminating the health knowledge through mobile phones, more so to the poor and the needy.

At the same time, a dissimilar aspect of reflection can be seen since only one third of the respondents did not consider receiving the text messages as a disturbance in their daily routine. However a neutral response of nearly half of the respondents towards receiving text messages brings an optimism to capitalize on the use of text messages for bringing the necessary health behavior among the people.

It can be seen that a good majority of the respondents feel that use of mobile phones is a convenient way for the health workers to reach out to them and deliver the services. As can be seen in the studies like Medhi et al., 2012; Udedi, 2014 ; Mendoza et al., 2014; Bhatnagar et al., 2012. MacPherson & Chamberlain, 2013, which reflect similar views but from the perspective of the health workers themselves. These study results are best vouched through the responses from the health workers in the qualitative study. The health workers feel the peer group and social pressure to integrate the use of mobile phones in their regular work routine. The credibility of their counseling and capability in the deliberation of their duties is perceived based on the possession of mobile phones and proficiency in its operation. In an Information and Communication Technology (ICT) enabled work environment, the possession of a basic and simple gadget mobile phones is considered indispensable.

Through the statistical analysis it can be understood that age of the respondents has not created any significant influence on the social influence construct to create the attitude towards using mobile phones for health services. Social influence for an Indian
public comes at all age levels as the societal structure is such that no individual can make a decision whether small or big without the consent and acceptance from their family, friends and other social groups.

On a similar ground, the education level of the respondents are found to be having no significant impact on grounds of social influence towards their attitude for using mobile phones for health services. An important point to be noted here is that the respondents in the plus two levels consider that social influence creates an impact in their attitude towards mobile phones usage for health services, while respondents with Post Graduate and above consider social influence on a lesser scale. However the differences of their opinion are not too significant for creating an effect on their attitude as a whole. Like that of the age, the education of the respondents also does not make them socially distinct to make decisions on their own for issues like health care delivery.

In contrast, the type of family set up has created a significant difference in crafting the attitude of the respondents for using mobile phones for health services. An interesting fact to be noted here is that the respondents from nuclear family show a greater inclination for social influence to create the attitude in comparison to the respondents from the joint family. A deeper analysis will show that for the women in the joint family the only mechanism that drives them towards a behavior will be compliance to the social pressures. Whilst, the women from nuclear family in addition to the compliance mechanism, they are driven through internalization and identification mechanisms targeting at status gains. Hence, there is a higher leaning towards social influence for women from nuclear family that coerce them towards using mobile phones for health care delivery purposes.

**Facilitating Conditions**

Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system (Venkatesh et al., 2003).

It includes aspects of the technological and/or organizational environment that are designed to remove barriers to use. When both performance expectancy constructs and effort expectancy constructs are present, facilitating conditions becomes non significant in predicting behavior intention.
On the other hand, the empirical results indicate that facilitating conditions do have a direct influence on usage beyond that explained by behavioral intentions alone.

Hence this study also tries to find the facilitating conditions that would influence the attitude of the respondents to use the mobile phones for health services.

In the technological society, the use of mobile phones has become more prevalent even among the most under privileged of the society. With this background, it comes as no surprise that the respondents of the study felt that the need for mobile phones in everyday life is high. In addition, they expressed that the mobile phones are found affordable to buy. With a near satisfactory network connectivity, the respondents conveyed that it will be easy for them to receive health information and other services from the health workers. The Indian rural population is dense at some places and scattered at many places. The health workers as well as the health department will be able to use mHealth only with the facilitating conditions for effective use of mobile phones is favourable. Evidences for such a condition is found in the studies of Medhi et al., 2012; Diwan et al., 2015 & Mahapatra & Sahoo, 2015.

Through the in-depth interviews from the Health workers, it is found that the use of mobile phones was making their work more simplified. With a bigger area to cater to, they feel that the use of mobile phones was possible with the network connectivity available in the places they visit. The need for network connectivity and the gadget susceptibility for effective performance of the health workers are highlighted through the studies of Apunyu, 2011; Medhi et al., 2012; Mohamed et al., 2014; Praveen et al., 2014.

The health workers also mentioned that along with the use of mobile phones, they are provided with lap tops and data cards and are trained for sending their reports to the central server. However, positive tendency towards the usage of technology and the training is found to be little lacking among the older health workers. The willingness to use the technology for their work routine among health workers is also found in studies such as Sittig et al., 2013; Van heerden et al., 2013 & Dantel, 2014.

An important observation to be made here is that though the health workers are provided with technological gadgets and the training to use, they are also asked to
continue with the cumbersome paper work as supporting evidence. Hence it is observed that technology has not produced the intended benefits for the health workers in this case.

The statistical analysis reveals that age of the respondents has significant influence in the formation of attitude towards using m Health based on the facilitating conditions. It is interesting to find that based on the results the respondents in the age of 25 years are found to be more inclined in attaching more importance towards facilitating conditions available for effective use of mobile phones. For the younger generation the novelty of using technology gains more value than any other factors. The older generation on the other hand will be more analytical in accepting any new possibilities, as the case with new technologies. The people with middle age group will look around for conditions that are favorable for the usage of newer ideas, as can be found with the findings. It can be noted that such an attitude is for the technology infrastructure conditions whereas the theoretical observations find that older people tend to give more importance for getting assistance in the performance of the act as such.

It is found from the statistical results that education has no significant influence for affirming any value to facilitating conditions in the formation of attitude towards usage of m Health. Further, the table of mean ranks reveals that there is no progressive significance attached towards facilitating conditions, as respondents with 10th standard and Graduation qualification show lower significance and respondents with Plus Two and Post Graduation qualification show a similar and higher significance. Thus, it can be inferred that the respondents have considered facilitating conditions for usage of technology for m Health more on an individual outlook, than on their educational qualification.

The requirements for the usage of technology have not been viewed differently by respondents based on the type of family set up they belong to. Based on the table of mean ranks, the difference of opinion in considering the conditions to facilitate the use of technology is very minimal for it to create a significant influence on the overall attitude for usage of mobile phones for healthcare services. It can be gathered that whatever is the family background, the essential conditions for the use of technology remains the same and that is confirmed through the statistical results.
Of all the Information and Communication Technologies, mobile phones are the most simplest and popular among all segments of society. This cannot happen if there is any impediment found in the conditions that facilitate the usage of technology, may it be the affordability, network connectivity or the infrastructure. The perspective, with which such conditions are looked at may vary but definitely accommodative to all moderators. The respondents of the study have been supportive of the available facilitating conditions in favour of the usage of m Health.

**Behavioural Intention**

Text messages are considered to be more effective by majority of the respondents as the messages could be stored and further used for reference at times of need. In addition, they are of the opinion that the messages can be shared with others found with similar health conditions. Such effective behavior intention created through text messages was experienced in studies such as Waka dha et al., 2013; GSMA maternal health programmes, 2014 & Khokhaar, 2009.

The responses through the qualitative study among the expectant mothers revealed that many of them are following the advice messages sent to them. There was a voluntary behavioural change among them including sleeping habits, drinking more water and more importantly taking the iron and folic acid supplements. Though they have been aware of such behavior all along, the messages are found to be instrumental in emphasizing the need of such behavior and resulting in the behavior itself. This was in line with the findings of the studies of Ramakrishnan et al., 2010; & Patnaik et al., 2014.

Though there has been no significant difference in the influence of behavior intention among different age group of the respondents, the statistical results show that the mean values among all age groups show leaning towards positive attitude towards using mobile phones for their healthcare needs. This is an important note to be considered by the health officials for designing m Health programmes in the future.

The statistical results show that respondent with plus two and post graduate expressed more positive inclination towards using mobile phones for their health needs. Based on their exposure levels on using various sources of health information, the people
with lower education background may have underestimated the utility value of the mobile phones. On the other hand, the respondents with post graduate levels may be aware of more sources of information and access, and hence are showing less inclination to use mobile phones for healthcare needs.

Based on the results, it can be seen that the women from joint family show a more favorable attitude towards using mobile phones for their healthcare purposes than the women from nuclear family. The use of mobile phones for their health needs have to be weighed against the risks involved. In this case, the women from joint family have the people in their family as a good support to back any such risks.

**Self Efficacy**

Self-efficacy and anxiety have been modeled as indirect determinants of intention fully mediated by perceived ease of use (Venkatesh et al., 2003) and UTAUT does not include them as direct determinants.

Most of the respondents felt that they are able to handle mobile phones with ease as they were using it every day. In addition, the responses in the qualitative study reveals that they are able to handle the text messaging feature of the mobile phones very confidently and hence possible to access the stored messages whenever they feel some doubt arising. It is evident that the text messaging ability of the people is influencing their use of mobile phones for accessing health care information which is similar to the findings of studies such as Khokhaar, 2009; Datta et al., 2014; Iribarren et al., 2013 & Christopher, 2013.

From the perspective of the health workers, their outlook towards using ICTs in their work routine has been greatly channelized through mobile phones. Regular use of the simple features of the mobile phones has given them great confidence in operating even the advanced features of mobile phones and other ICT gadgets. This confidence in their efficiency enables them to send regular updates and reports to their superiors and the central servers with great ease. Such confidence of the health workers can be seen in the studies of Palazuelos et al., 2013; Chib, Lwin & Jung, 2009 & Murthy et al., 2012.
The statistical analysis shows that age of the respondents has no significant influence on the attitude of the respondents towards use of mobile phones for health services based on their self efficacy. Through a closer analysis of the mean value of the responses it can be inferred that there is neutrality in what people think about their self efficacy in handling mobile phones as such. Though the use of mobile phones is widespread, many of the respondents widely use only voice calls and text messages on a large scale and they always are uncertain on their ability to handle other advanced features.

It should be noted that the education level of the respondents has not played a role in shaping the self efficacy of the respondents and thereby influencing their attitude to use mobile phones for health care purposes. The respondents with Post Graduate level had the lowest mean rank in comparison to the respondents with Graduate and Plus Two levels.

Similarly, the respondents from joint family and nuclear family do not differ in their attitude towards use of mobile phones for health purposes. The respondents from nuclear family are found to be inclined and confident of their self efficacy and thereby showed a better attitude towards the use of mobile phones for health care services. Women from nuclear family have a better exposure for technology and liberty to use the mobile phones at their own convenience. This has placed them in a more advantageous position in handling the mobile phones and various features in it.

**Attitude**

Attitude toward using technology is defined as an individual’s overall affective reaction to using a system (Venkatesh et al., 2003). It is theoretically presented that Attitude of the people takes a direct and significant role only when the constructs of Performance Expectancy and Effort Expectancy are not concerned. However it should be noted that some of the omissions of Effort Expectancy can play a role in the formation of attitude towards usage, if not behavior intention. Hence this study has placed its concern on the attitude of the people towards technology that will influence in the usage of mobile phones for their healthcare purposes.
It is found through the responses of the study that majority of the respondents are showing favourable attitude towards use of mobile phones as they consider mobile phones are an essential part of their daily routine and as they carry it wherever they go it is a very good companion to them. The positive attitude towards mobile phones is a valuable input in the implementation of m Health on a large scale. Hence with the prevalence of favourable attitude, potential of m Health in being instrumental for a constructive change in the health care provision is possible.

The in depth interviews with the respondents confirmed the findings of the studies of Datta et al., 2014; Cormick et al., 2012 and Evans et al., 2012. The expectant mothers are found to be expressing willingness to receive antenatal care messages through mobile phones. More interestingly they found it convenient to access information in a gadget that was available with them all the time. As the respondents held high trust and belief on the content of the antenatal care messages they received, they wanted such health messages to be given for post natal period too. To be more specific, they wanted messages on health behavior in post natal period, vaccination reminders and how to take care of the new born. Such an overwhelming expression of trust and belief on the messages brings more hope for the implementation of m Health for maternal health as such.

Being the first point of contact in healthcare provision, the health workers are of the opinion that the text messages sent to the expectant mothers will be a reinforcement of the behavior that they are insisting during their counseling. In cases of chronic diseases, usage of m Health eases their burden of explaining the need for continuous treatment and also in the delivery of treatment. This goes in line with the findings of the study by Palazuelos et al., 2013.

The statistical analysis of the study shows that age as well as type of family set up does not show any significant influence on the attitude towards using m Health based on their attitude towards mobile phones and antenatal care. For any expectant mother, antenatal care is important irrespective of the age group or the type of family they belong to. Moreover, pregnancy occurs within an age group, say 18 years to 35 years where they exhibit very slight differences in the usage and attitude towards technology, especially
the omnipresent mobile phones. Usage of mobile phones is prevalent among all people and hence their perception on mobile phones also does not vary with the type of family set up they belong to. An influence on the formation of attitude towards using mobile phones can be found in the study of Jager & Belle, 2014.

On the other hand, education level of the respondents is found to be an influential factor in the formation of attitude towards using mobile phones. A requirement of basic technical literacy and language literacy is warranted for effective use of mobile phones. Hence a definite variation is found among the respondents when text messages are conveyed through mobile phones. In addition to accept a new idea of receiving health care messages depends on the level of exposure and outlook of the individual. This again is bound for differences based on the education levels of the respondents. The influence of education in the usage of mobile phones for healthcare purposes can be found in the studies of De Souza et al., 2014; Evans et al., 2012; and Lund et al., 2012.

5.3 Suggestions

The success of m Health depends on its ability to address the knowledge gap existing among the receivers. While designing the content for the m Health programmes, the knowledge gap that exists in that area of health need to be reviewed. A system of review can be developed by both the public and private players to identify the knowledge gaps amongst the varied population.

In the process of addressing the knowledge gap, the developers of the content of m Health should take into consideration the culture and tradition of the society being addressed. Contradictions to their traditions will alienate the receivers from internalizing the message and adopt the behaviour. An alternate way is to deliver the messages with scientific explanations and convince the receivers beyond doubt.

In the treatment procedure of certain health ailments such as HIV, social stigmas are setbacks for the patients. While using m Health in such cases, the security and confidentiality of the patient information and treatment conditions should be ensured.

Till date, m Health is in its infancy in spite of its existence for more than a decade. If m Health need to scale up, the providers should add more valued services
along with the delivery of the content. When a patient registers for a treatment with the provider, m Health can include services such as fixing the appointment, medical prescription, medication reminders, and tips for healthy behavior, food and nutritional aspects. When the role of mobile phones is felt in each stage of their treatment, the existence of m Health will then be realized more prominently.

Non-availability of local language fonts in the mobile handsets is considered to be a bottleneck in the delivery of text messages to the rural and the marginalized. When m Health interventions target such a population through text messages, ensuring of local language text in their handsets or providing them with such handsets will make the implementation more purposeful.

It is a known fact that the average out-of-pocket expenses for health care are high in India which actually refrain the ruralite and the poor to access institutional healthcare. This is where m Health plays a lead role to deliver quality health care services. The beneficiaries, mostly the rural and the poor will be reluctant to access the m Health services if there is a cost factor involved in it. Hence the private providers and the public authorities should make available these services at low or no cost.

When m Health is in practice, a sharing of patient information amongst the providers will become imperative. For this reason, a database of the patients with relevant information such as name, age, their health profile, addresses and contact should be collected and made available with all the providers. Such data collection itself can be done through mobile phones and sent to a central server.

The major users and delivery agents of the m Health projects, the health workers face considerable difficulties which hamper effective management of the projects. Appropriate training for both the providers like health workers and the patients to use m Health tools will ensure continuous and accountable response for the m Health applications.

There should be yardsticks which can measure the quality of the services rendered. Not from the point of view of technology alone, but also from the kind of services offered. Along with quality, the answerability to the ill effects of m Health needs to be addressed.
An overall strategy across India to use m Health for health awareness campaigns can be taken up by the government. Given an established infrastructure, network connectivity and the largest public telecommunication provider in their ambit, Government of India can as well spread its wings and implement many m Health programmes

The onus is on the government to use m Health for public information campaigns on daily basis for the general health issues as well as chronic illnesses. Seasonal contagious disease conditions like dengue, chikungunya can be suppressed through rigorous and mass level awareness and prevention campaigns through mobile phones.

5.4 Suggestions for future research

1. The cost factor analysis of implementing m Health projects was not considered in the present study. The most important factor for consideration in scaling up m Health in India will be cost of operation. As there are only few studies that estimate the cost of m Health interventions, a separate study divulging on the cost factor can be carried out.

2. A systematic review of the knowledge gaps that exists among the expectant mothers was not elaborately undertaken. Only a sketchy response was obtained from the expectant mothers before developing the antenatal care messages. A study dwelling on a detailed review of such knowledge gaps will suffice in creating effective interventions on a larger scale.

3. Trust and confidentiality of the intervention and the messages were not covered adequately in the present study as the expectant mothers were well aware that the messages are sent with the consent of the health authorities. When it comes to health communication, these factors play a vital role. Hence how these factors accentuate the acceptance of m Health interventions can be studied.

4. Though the study was undertaken among the rural and semi-urban expectant mothers, their socio-demographic profile will be different from that of a tribal village as well as to that of urban women. An assessment on the socio-economic factors that will influence the implementation of m Health interventions will be very useful.
5. The study largely covered the responses from the beneficiaries of m Health. A supply side perspective of m Health with the perceptions of the Health Institution, Health Officials, Doctors and Nurses will render an overall dimension to m Health.

5.5 Conclusion

Amongst the Information and Communication Technologies (ICTs), mobile phones are considered the most democratic medium which has created avenues and opportunities for the marginalized to breeze into the mainstream society. The democracy of the medium naturally percolates to m Health too by way of connecting the people from rural and remote areas to a regular and quality healthcare delivery.

The use of a personalized medium like mobile phones allows for the establishment of a homogeneous environment in the knowledge transfer of health issues. The rich and the poor are reached out with the same content, same medium on equal scale for the same reasons of health issues. A compendious inquiry on the presence of mobile technology reveals that the medium is cost effective by ways of both the technology as well as access. Hence affordability to the medium and its services has become universal.

For many of its users, mobile phones are colossal facilitators of communication and socialization. Avenues for new uses of this technology have been realized with the advent of m banking, m governance, m learning and so on. Though these are not very popular currently, there are chances that by the use of such services, the divide between the haves and have-nots may deepen. However, the need for healthcare is universal and basic. In this context, m Health will make an alternate impact of bridging the divide between the haves and have-nots.

Even with the great services of m Health, it can only be concomitant to the services of a medical consultant. As a valuable communication tool mobile phone technology can establish good link between the beneficiaries and the providers, but in no case it can be a surrogate to the providers. The authenticity to the information shared or the services rendered can only be established with the presence of the qualified providers in some way or the other.
Mobile phone technology has broken down the communication barriers that existed previously in the healthcare system. A balance in the communication environment of the system enables for an impending development in the lives of many. With the advent of m Health or mobile phones as such, women have become more information empowered as the medium allows them to consult the Doctors, VHNs without any inhibitions. This applies with the so-called information poor also. They are now able to freely communicate to their trusted sources of information and be information empowered. This intellectual growth leads to the social growth across all segments of the society.

In a developing country like India, the technology, infrastructure, human and financial resources for establishing an equal and quality healthcare delivery are really scarce. With the availability of the cost effective, instantaneous and simple mobile technology across the varied population, the health services can be delivered to the doorsteps of the poor and the needy and be truly transformative in their lives.

In India, the need for a powerful m Health strategy is required not only from the public health providers, but also from the private players. There is a big dearth in the proportionate availability of health personnel to the patients and this lacuna can be abridged through the use of mobile phones for addressing the basic and minor health services to the larger population of India.

In the pursuit to implement m Health projects for an equitable development in the healthcare delivery, the providers as well as the beneficiaries should weigh the ifs, buts and nots of m Health on a categorical balance. The clear understanding of the benefits, hurdles and blockades on a futuristic perspective will provide m Health its due accedence.