Original Research Article

IMPACT ANALYSIS OF ICT ON WOMEN IN AGRICULTURE: A STUDY CONDUCTED IN JORHAT DISTRICT OF ASSAM

ABSTRACT

ICT led extension system is capable of changing farmers' lives by improving access to information and sharing knowledge through click of a button. Such approaches are far more important and essential for women farmers who are overburdened and hard pressed for time. Realizing the ever increasing role of women in agriculture and the need for empowering them in technological domain, the present study was conducted to study the level of knowledge of Farm Women Knowledge Group (FWKG) members on different aspects of selected ICT tool, find out the level of use of ICT tool by the FWKG members and to study the impact of intervention programmes on knowledge and use of selected ICT tool. Rural women having farming as an occupation were selected purposively. Six Farm Women Knowledge Group (FWKG) comprising ten members each were formed for the study. Intervention programmes were conducted for the members of FWKG including awareness programme, training and workshop. Interventions were home based, farm based and community based activities. Pre and post- test were conducted to assess the impact of the intervention programmes. Further relationship of socio-personal characteristics of the members with their knowledge and use of selected ICT tool were examined. The study reveals that post intervention levels of knowledge and use of selected ICT were better than pre intervention level among the FWKG members. High level of knowledge increased from 20.00 per cent to 48.33 per cent whereas low level of knowledge decreased from 45.00 per cent to 6.66 per cent. Similarly in case of high level of use increased from 6.66 per cent to 48.33 per cent.Knowledge and use of selected ICT tool was positively related in both pre and post-intervention phase. Paired 't' test implies that there was gain in knowledge after the intervention programmes. Similarly significant difference in use of selected ICT tool between the pre and post intervention was also found. It may be concluded that such interventions may increase the level of knowledge and use of selected ICT tool and such model may be replicated in other areas at micro level.

Key words: *Impact, ICT tool, women in agriculture*

INTRODUCTION

Agriculture is the major sector of Indian economy. The agriculture sector employs nearly half of the workforce in the country. However, it contributes to 19.9% of the GDP. Though

agriculture is primary source of income for more than fifty per cent of people in India, it is still lagging behind many aspects and characterized by small land holding,non or less adoption of improved technology, poor connectivity, disintegration of market, unreliable and delayed information to the farmers and so on. The present day digital revolution has changed the working of people including agriculture.Information and Communications Technologies (ICTs) may improve the lives of smallholder farmers in many ways, from monitoring crops to tracking market prices;enhanced on-farm productivity by reducing the constraints of extension and information, facilitating market transparency and improving logistics(Mittal and Tripathi, 2009, Mittal *et al.,* 2010, WDR, 2016). However, illiteracy, less wireless connectivity like telephone, less sharing of information among the farmers, limited time to use mass media sources significantly affect the awareness, utilization and perceived effectiveness of different communication sources(Bagal*et al.*, 2020).Women play a fundamental role in agricultural production and agriculture sector employs 80% of all economically active women in India; they comprise 33% of the agriculture labour force and 48% of the self-employed farmers (Anon., 2018 a). Though females play an important role in agricultural production, but are constrainted by digital, rural and gender, and that leads them to less access to ICTs, leaving them and their families at a disadvantagestate(Anon., 2018 b). Social norms, lack of connectivity and poverty are some of the reasons thatmakerural women less access to ICTs. Gender inequalities remain a serious issue in the digital economy, as does the gap between urban and rural populations. Identifying the right mix of technologies and strategies that are gender-sensitive and suited to local needs are critical in increasing farm efficiency and revenues. Access of rural women to ICTs, usage of ICTs by rural women and understanding various agro-technologies by rural women through ITCs will benefit the women in increasing agricultural production and to challenge the existing gender imbalance in rural livelihoods. The present study was carried out with the aim of studying the impact of intervention programmes on knowledge and use of ofselected ICT tool by FWKG members. Further it explored the relationship of socio-personal characteristics of the members with their knowledge and use of selected ICT tool.

METHODOLOGY

Selection of sample

The study was conducted in Jorhat district of Assam.Koliapani block was selected through simple random sampling method. Five villages were selectedpurposively from the block in consultation with the Director of Research, Assam Agricultural University(AAU), Jorhat and Scientists from Krishi Vigyan Kendra, Jorhat. Selected villages were within the radius of 30 kms from the AAU having good connectivity. Rural women having farming as an occupation were selected purposively. Six Farm Women Knowledge Groups (FWKG) were formedin the selected villages, each group comprising ten members per group totalling to 60 members.

Data on socio-personal profile, knowledge and use of ICT tool by FWKG members in agriculture and allied sectors before and after the intervention programme was collected by using a structured interview schedule. Among the ICT tools,mobile phone was selected for the study as it is the most usedICT tool where one can access all types of information provided having an internet connection, handy and comparatively cheaper.

Measurement of variables:

Knowledge& use of different ICT tools & services:

Knowledge on ICT tool was assess in terms of its functions, different apps and services along with their uses was collected. Level of knowledge was asked in three point scale *i.e*. 'no knowledge', 'partial knowledge' and 'complete knowledge' with the score 0, 1 and 2 respectively. Interview was conducted at two different point of time i.e. pre-intervention period and post intervention period. Respondents were categorized as 'no knowledge', 'medium knowledge'and 'high knowledge' using percentile, based on the obtained scores of the respondents. Similarly in case of use, respondents were categorized as 'no use', 'medium use'and 'high use' category using percentile.

Intervention programme:

Intervention programmes were conducted for enhancing the knowledge and use of selected ICT tool for agriculture and allied activities for the FWKG members. Interventions were home based, farm based and community based activities. Intervention programmes such as 'Training on Mobile functioning including receiving and sharing of messages', 'Training on selection and installing of different apps (Agriculture and allied activities) including functioning of internet, utility services on internet and use of social media', 'Awareness on Digital Literacy and Climate Change by using ICT Tools', 'Workshop on digital literacy' and 'Follow-up actions' were conducted. Impact of interventions was assessed with post- test.

STATISTICAL PROCEDURE

After collection of data, the gathered data was coded, tabulated and statistically analysed. The following statistical techniques were used for analysing the data on different aspects of the study.

Frequency and percentage

Frequency and Percentage was calculated to find out the socio-economic profile of the respondents.

Formula used for calculating percentile

$$P_i = \frac{i(N+1)}{100}$$

N = no. of total observation

Formula used for calculating mean

$$\text{Mean}(\bar{x}) = \frac{\sum fx}{N}$$

Where, ∑fx= Total scores

N= Total number of respondents

Standard deviation was calculated by the formula

$$SD = \sqrt{\frac{\sum (Xi - \overline{X})^2}{N}}$$

Where,

X_i = Raw score

$\bar{X}$ = Mean

N = Total respondents

Correlation co-efficient

Karl Pearson's product moment method for Correlation Co-efficient was computed to find out the correlation of knowledge and use of selected ICT and socio-personal characteristics of the members. The formula used for calculating the Correlation Co-efficient is:

$$r = \frac{\sum xy - \frac{(\sum x)(\sum y)}{N}}{\sqrt{\left\{\sum X^2 - \frac{(\sum X)^2}{N}\right\}\left\{\sum Y^2 - \frac{(\sum Y)^2}{N}\right\}}}$$

Where,

r =Correlation Co-efficient

X = Independent variable

Y = Dependent variable

∑XY = Summation of total product of X and Y

N = Total number of respondents.

In order to test significance of Correlation Co-efficient, the Fisher 't' ratio was found out by using following formula:

$$t = \frac{r}{\sqrt{(1-r^2)}} \times \sqrt{n-2} \text{ with } (n-2) \text{ d.f.}$$

Where, r =Correlation Co-efficient

n = Number of observations

d.f.= Degree of freedom

3.8.6 Paired t test

$$t = \frac{|\bar{d}|}{s\sqrt{n}} \text{ with } (n-1) \text{ d.f}$$

Where, $\bar{d}$ = mean of the differences

s = estimates of the standard deviation

$$= \sqrt{\frac{1}{n-1}\Sigma(d-\bar{d})^2}$$

Where, d = difference of the paired of values

$\bar{d}$ = mean of the differences

RESULTS AND DISCUSSION:

It was revealed from the Table 1 that 43.30 per cent of the respondents belonged to middle age group between 36 to 50 years, one third (35.00%) respondents were HSLC passed.All the respondents were married and majority had small size family with nuclear type.Regarding occupation, 32.00 percent respondents had farming as the occupation of herself and her family and land holding ranged from marginal to medium. Forty five percent respondents were marginal farmer and 31.60 per cent and 23.30 per cent were reported as small and medium farmer respectively. All the respondents were member of at least one group or organisation besides FWKGs. More than half of the respondents *i.e.* 66.60 percent were general member of one or more organisation whereas 33.30 percent respondents were office bearers. The data reflected that farm women were already aware of the benefits of organisational membership.

Table 1: Socio personal characteristics of the respondents by gender

(N=60)

Attributes	**Frequency (f)**	**Percentage (%)**
Age		
18-35 years	22.00	36.60
36-50 Years	26.00	43.30
Above 50 Years	12.00	20.00
Education Qualification		
Primary	8.00	13.30
Middle	4.00	6.60
HSLC Passed	21.00	35.00
HS passed	12.00	20.00
Graduate	5.00	8.30
Marital Status		
Married	60.00	100.00
Family Size		
Small	31.00	51.60
Medium	19.00	31.60
Large	10.00	16.60

Family Type		
Nuclear	44.00	73.30
Joint	16.00	26.60
Family occupation		
Farming	32.00	53.30
Service	12.00	20.00
Farm Allied	5.00	8.30
Business	11.00	18.30
Occupation of Respondents		
Farming	32.00	53.30
Service	12.00	20.00
Farm Allied	16.00	26.60
Land Holding		
Marginal	27.00	45.00
Small	19.00	31.60
Medium	14.00	23.30
Membership Status		
General Membership	40.00	66.60
Office Bearer	20.00	33.30

Level of Knowledge and use of FWKG members on selected ICT tool

It is observed from the Fig .1 and Fig .2 that, there is increase in knowledge and use about selected ICT tools in post intervention test compared to pre intervention knowledge and use. High level of knowledge increased from 20.00 per cent to 48.33 per cent whereas low level of knowledge decreased from 45.00 per cent to 6.66 per cent. Similarly in case of high level of use increased from 6.66 per cent to 48.33 per cent. This may be due to the fact that after getting exposed to different ICT tools, farm women started utilizing it in the best possible way and with enthusiasm. Further, they got exposure to Youtube and have started using Youtube for preparation of different products on their own. These data were highly supported by the study conducted by Mittal and Mehar, 2012, and Meghwal and Jadav, 2021that farmers were use mobile phones mainly for social communication but later they have increasingly started using it to get connected with people like traders and other farmers who have agricultural activities related information.

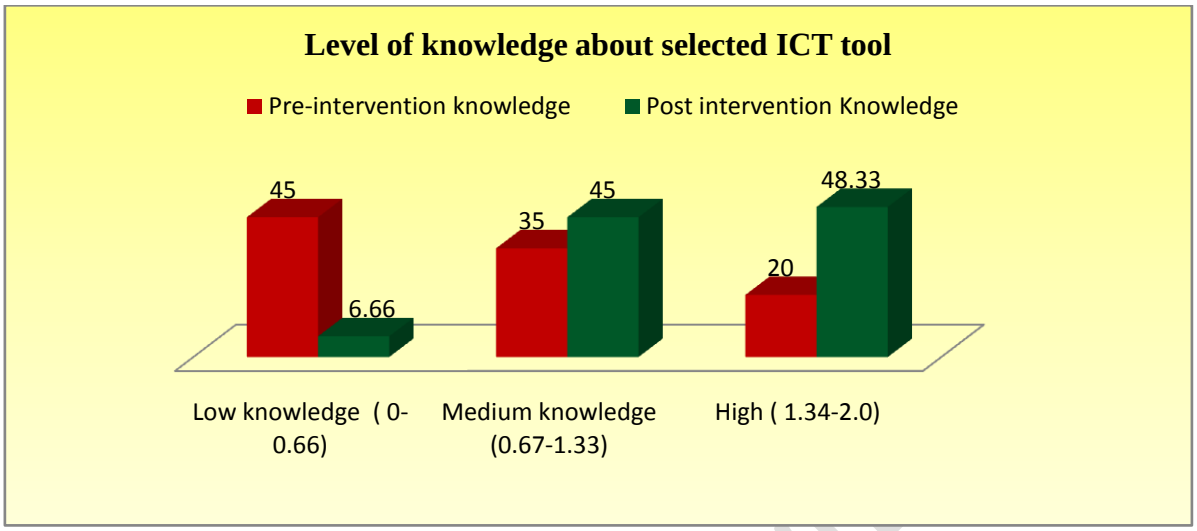

Fig 1 Level of knowledge of selected ICT tool in pre and post intervention period

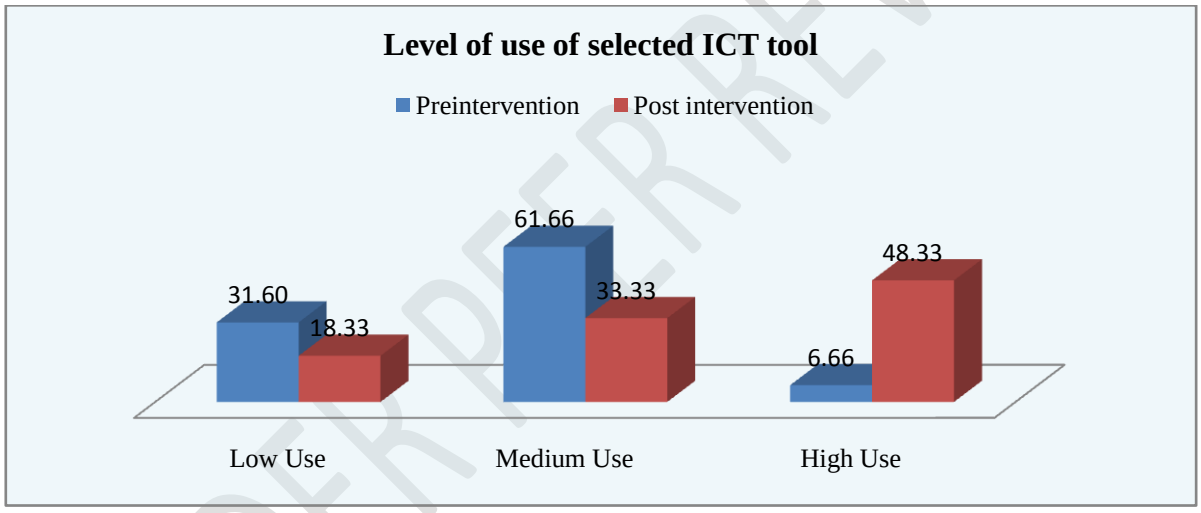

Fig 2: Level of use of selected ICT tool in pre and post intervention period

Level of knowledge about different aspects of selected ICT tool in pre and post intervention period

It is revealed from the Fig 3 that complete level of knowledge was enhanced up to 41.66 percent after intervention in case of mobile functioning while in pre-test it was 20 percent only. In case of functioning of Internet it was found that there was increase in complete knowledge from 15.00percent to 48.33 percent after the intervention period. Knowledge on utility services on internet was enhanced from 13.33 percent to 50 percent. Even in social media complete knowledge was increased from 18.33 percent to 48.33 percent. It was surprising to note that knowledge onapplication of agriculture and allied activities was

increased from 8.30percentcomplete knowledge during pre-intervention to 40 percent in post-intervention period.

Similar findings were reported by Anderson and Feder, 2007;Ali and Kumar, 2010; Mittal*et al.*, 2010; Mittal and Meher, 2014.

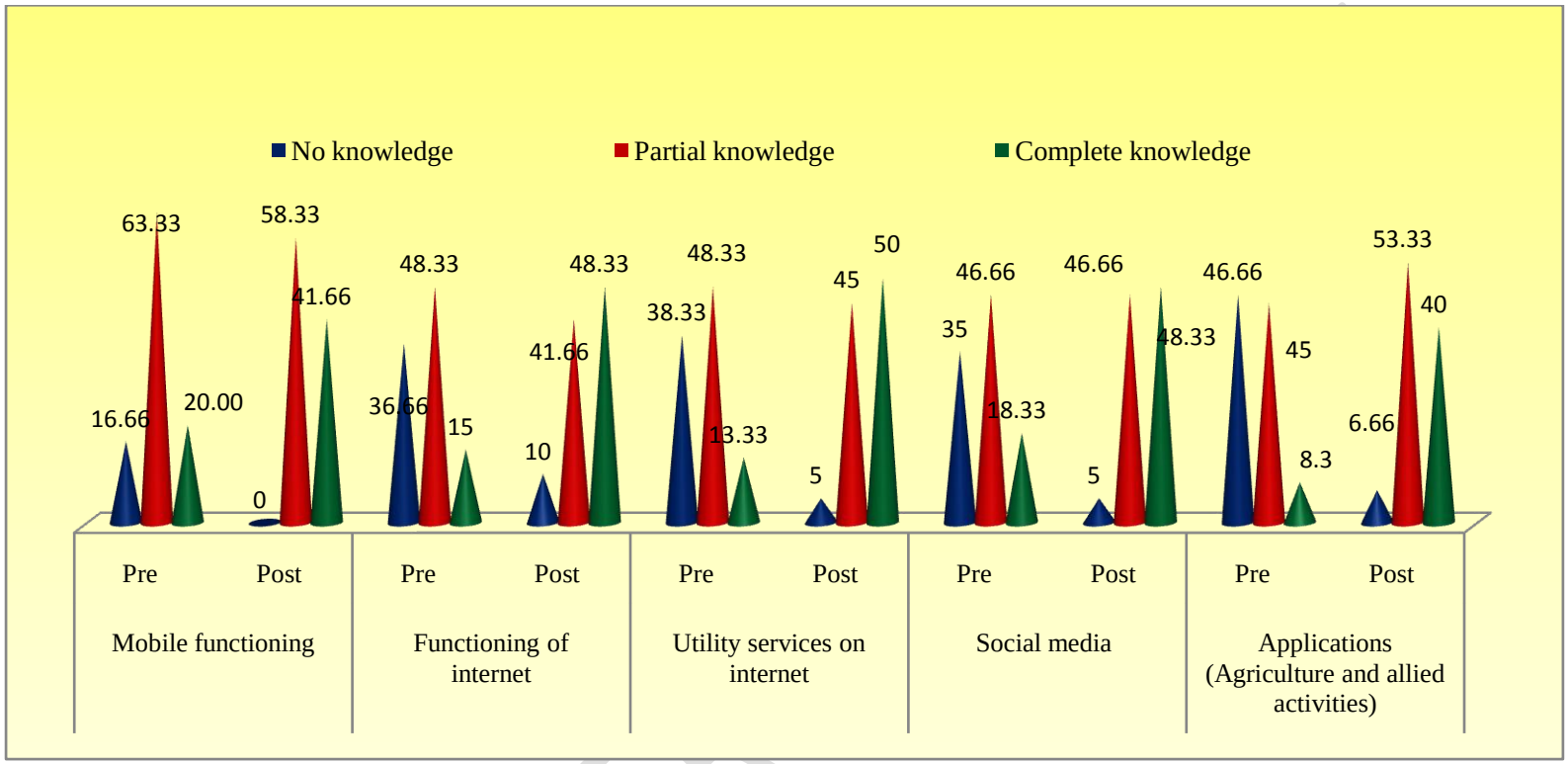

Fig 3Level of knowledge about different aspects of selected ICT tool in pre and post intervention period

Level of knowledge about use of different aspects of selected ICT tool in pre and post intervention period

In case of functioning of internet it was found that partial knowledge about use of internet was higher in both pre and post intervention period in all the aspects of mobile use. Data reveals that post intervention knowledge on use of most of the aspects of mobile phone was more than pre intervention, however highest increase was observed in 'applications for agriculture and allied activities' where complete knowledge was increased from nil to 40.00 per cent. This was followed by use of 'social media' where complete knowledge on use of social media increased by around 40.00 per cent i.e. from 6.66 per cent to 45.00 per cent. (Fig. 4)

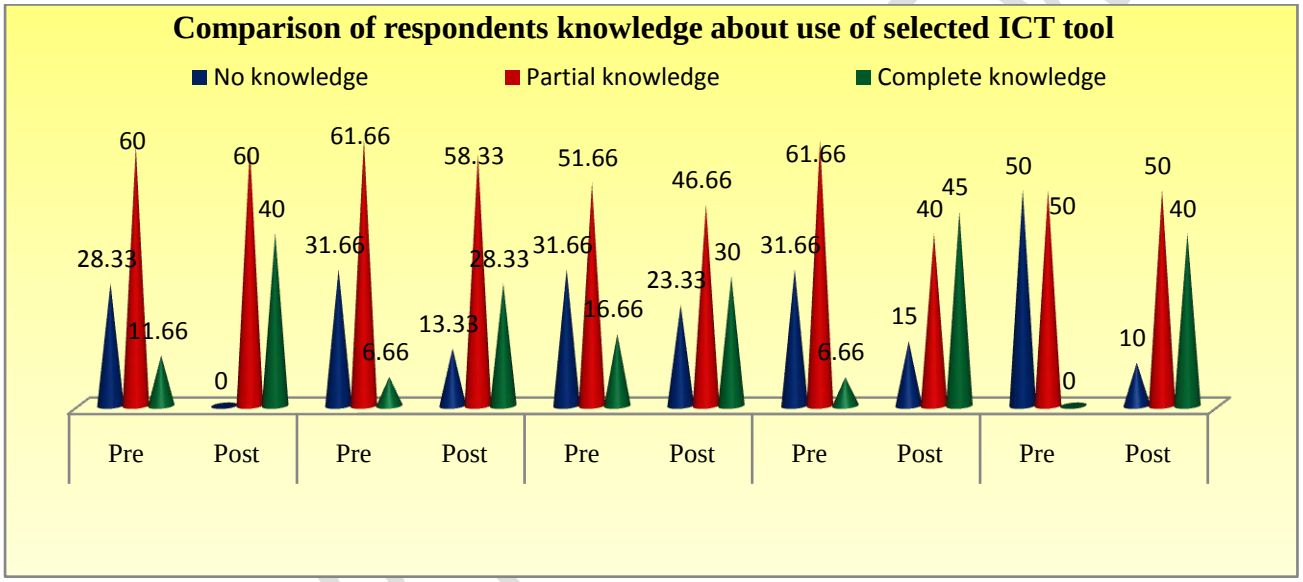

Fig 4: Level of knowledge about use of different aspects of selected ICT tool in pre and post intervention period

Relationship of Knowledge and Use of selected ICT tool

The 'r' value of pre intervention knowledge and use was found to be positively correlated with 'r' 0.589 and for post intervention it was found to be positively correlated with 'r' value 0.901. It signifies that in both the pre and post intervention phase knowledge and use of ICT tools was positively correlated. (Table 2). From the table it is observed that't' value for knowledge of ICT was -9.596 which was higher than the critical value of 't' with 59 degrees of freedom reflecting significant difference of mean score of the knowledge on ICT. This implies that there was knowledge gain after the intervention. Likewise in case of Use of ICT, 't' value was found to be -12.435 which was greater than critical value of 't' reflecting significant difference in use of ICT between the pre intervention and post intervention mean score.

Table 2: Relationship of Knowledge and Use of selected ICT tool

(N=60)

Intervention	Pre-intervention mean score (0-2)	Post intervention mean score (0-2)	Mean difference/Gain	't' Value
Knowledge of ICT	0.8033	1.4033	0.60	-9.596
Use of ICT	0.736	1.243	0.50	-12.435
r value	0.589	0.901	0.31	-

Relationship of socio-personal characteristics of the members with their knowledge and use of selected ICT tool

In both pre and post intervention of knowledge and use of ICT tools, age was negatively related. It implies that with increased age, both knowledge and use decreases. Contrary to this in case of both knowledge and use, education was found to be positively related which signifies, with higher level of education, knowledge and use of ICT tools increase. In both knowledge and use 'r' value was higher in post intervention period.

Table 3: Relationship of personal and social characteristics of the members with their knowledge and use of selected ICT tool

(N=60)

Profile variable	Knowledge 'r 'value		Use 'r 'value	
	Pre Intervention	Post intervention	Pre Intervention	Post intervention
Age	-0.281	-0.632	-0.6744	-0.764
Education	0.477	0.582	0.755	0.644
Family size	-0.310	-0.510	-0.423	-0.474
Landholding size	0.0076	-0.216	-0.197	0.413

CONCLUSION

The findings of the study revealed that knowledge and use of mobile were better in post-intervention phase than the pre intervention phase. Comparison of knowledge and use of different aspects of ICT tool reflects that 'application of agriculture and allied activities' was found to be highly increased in post-intervention phase while compared with pre-intervention

phase. Positive correlation was found between knowledge and use of ICT tool in both pre intervention and post intervention phase. Age was found to be negatively correlated with both knowledge and use of mobile whereas education was found to be positively correlated. It may be concluded that there had been significant impact of ICT intervention in knowledge and use of different aspects of mobilewhich may scaled up with other ICT tools and may be replicated in other areas.

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