Role of the ICT in Women's Empowerment and Achieving SDGs 2030: A Case Study of Pakistan by using PDHS Data

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Abstract

The frequent use of Information and Communication Technology (ICT) has significantly reduced the gender inequality manifold within and across the countries. The study examines the association between ICT and women's empowerment in Pakistan in the light of Sustainable Development Goals (SDGs). The data for study has been taken from Pakistan Demographic and Health Survey (PDHS) 2017-18. The study uses logistic regression in determining the factors that influence women's empowerment by examining the relationship between ICT and women's involvement in decision-making with other control variables. Results indicate that ICT has positive and significant impact on women's empowerment. Employment, age, residence, higher educational attainment, wealth index and women with two or more number of sons are important factors for women's empowerment.

Keywords: ICT, women empowerment, SDGs, PDHS, decision-making, logistic regression

Introduction

The easy access and the use of Information and Communication Technology (ICT) has significantly reduced the gender inequality over time in many parts of the developing world. In developing countries disadvantaged groups especially, women are facing many economic and social obstacles in participating the decision regarding their own life. The lifestyle of people living in these countries can efficiently improve by providing them the easy access to the technology. Hence the ICT can provide more than just information to women and therefore, also fostering the process of sustainable development (Mackey 2012).

Women are an essential part of the domestic and global workforce. Female labour force participation rate for developed countries is around 80% and for developing countries it is almost 40% (ILO 2018). Nevertheless, ICT is playing vital role to improve women in the developing countries. Women's empowerment can be analyzed using measures such as participation in decision-making at household level

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(Ndaimani *et al* 2018; Afifi 2009). Additionally, it has been found that the socioeconomic empowerment of women can be achieved by the use of ICT which in turn positively influences the participation of women in decision making (Joseph 2011).

The potential scope of the ICT for empowering women is very crucial for the patriarchal country like Pakistan, where it is hard for women to go out for their financial needs. The easy access and effective use of the ICT by women, in return promoting the socio and economic development as the ICT brought new jobs opportunities for them. Therefore, there is a need for mainstreaming the transformation of the ICT sector by integration of women into the sector (Marcelle 2000).

The 2030 agenda for the Sustainable Development was launched in 2015 and it has emphasized a lot on gender equality and women empowerment. Agenda 2030 is a comprehensive agenda with the slogan of "leaving no one behind". Therefore, a dedicated goal 5 out of the 17 goals aimed at promoting gender equality and empowerment of all women and girls. While the target 5b emphasizes empowering women through technology. Achievement of SDGs in general and target 5b in particular will play an effective role in women empowerment.

The constitution of Pakistan gives equal rights to women and every successive government has tried to promote socioeconomic status of women. There is general agreement that women should be empowered for playing an active part in county's progress. However, women's empowerment remained major concern in Pakistan and the country remained on the lowest notches in gender parity indices. It has been observed that gender equality is essential for economic progress and boost human well-being of a country. Therefore, Women's disempowerment has taken the attention of academicians and policymakers. It has been realized that there is a need to analyze the determinants of women's empowerment to form policies for national development.

Pakistan is a developing country with a population of 220.875[1] million and 24.3[§] percent of that population lives below the poverty line. It has been observed that women's status in Pakistan is not socioeconomically comparable with men. The gender gap is very high in Pakistan and it is depicted in Global Gender Gap Index, which places Pakistan on 151st rank out of 153 countries (WEF 2020). This is an indication of the alarming situation of gender inequality in the country.

[1] Pakistan Bureau of Statistics 2020

[2] Planning Commission (2018), "National Poverty Report 2015-16"

The low rate of women's participation in economic activities and lower levels of educational accomplishment than men in Pakistan is a major reason for hurdles in women's empowerment (Riaz & Pervaiz 2018). Pakistan is a patriarchal society and there is a continuous increase in discrimination against women, which causes rise in the gender gap in all sectors (UNICEF 2006). Unfortunately, patriarchal and social norms restrict women's participation in the labour force. There is a need to empower the women of Pakistan so they could improve their living standard and could contribute towards inclusive economic progress of the nation (Akram 2018).

Objectives

Nowadays, this is burning issue and a dire need to study the factors that can help the policy makers in Pakistan to achieve SDGs with special focus on ICT for women's empowerment. Therefore, present research conducted to explore the impact of ICT and other possible factors that have influenced women's empowerment in light of SDGs in Pakistan. Pakistan faces great challenges in achieving gender equality. The study has following objectives.

- Present study assessed the association between women's empowerment and selected ICTs indicators with socioeconomic and demographic factors based on household surveyed data (PDHS) from the year 2017-18.
- The study will also highlight the important indicators along with ICTs that may play critical role in improving gender equality and enhance the process of achieving SDG 5 in Pakistan.
- This study also addresses the gap in the literature on women's empowerment, ICTs and SDGs in Pakistan.

The study is further divided into the following sections. Section 2 discusses the literature review while section 3 mentions data sources and variables description. In section 4 there will be methodology and section 5 will provide the discussion of the empirical results which will be followed by conclusion and recommendation of the study in section 6.

Literature Review

Empowerment is a complex and a multidimensional phenomenon, as some policy or action valid for one country may not be true for other countries because of the difference between sociocultural and ethical norms among countries and this results in different proxy indicators for empowerment (Chaudhry & Nosheen 2009; Cornwall & Edwards, 2010;

Thandar *et al* 2019). Most of the definitions of empowerment indicate that it is an ability to take decisions and control own destiny.

Mansell (2014) considered, empowerment as a practice which includes a shift from a state of disempowerment to the empowerment. World Bank (2017) defined empowerment as the procedure which has the ability to make choices and convert those choices into an outcome. The women's empowerment is conventional aspect of economic progress which has been admitted locally nationally and globally (UNDP 2016).

The theory of empowerment comprises of three interconnected dimensions: resources, agency and achievement (Kabeer, 1999, 2001). The dimension of agency got main attention and shows comparative women's power with their partners, which also reveals their independence (Chaudhry & Nosheen, 2009). The conceptualizations of women's empowerment, the term independence explicitly discusses the woman's decision-making power and freedom (Thandar *et al,* 2019).

There are number of studies which have specified numerous indicators as influencing a women's agency and their ability to engage in a patriarchal bargain with their husbands. These factors include educational level, literacy, household size, age at marriage, income, marital status, employment, number of living children, and wealth status (Thandar *et al* 2019; Akram 2018; Riaz & Pervaiz 2018; Chaudhry & Nosheen, 2009).

Information is considered as a prerequisite for empowerment, while participation drives empowerment by encouraging people to be actively involved in the development process, contribute ideas, take the initiative to articulate needs and problems and assert their autonomy (Obayelu & Ogunlade, 2006).

Successful case studies from many countries describe the use of ICT as a tool for the economic empowerment of women (Prasad & Sreedevi, 2007), participation in public life (Lennie, 2002), and enhancing women's skills and capabilities in society (Mitchell & Gillis, 2007). When used effectively, ICT can create better opportunities for women to exchange information, gain access to on-line education and to engage in e-commerce activities (Marcelle, 2002).

In the study (Akram, 2018) has used the data from PDHS 2012-13 and examined the variables which mostly play a role in empowerment of women in Pakistan. The study estimated Logit and Ordered Logit models to explore that age, residence, education of women, participation in paid jobs, ownership of assets, wealth index, number of sons and daughters alive and the use of electronic media have a significant impact on women's empowerment (Akram, 2018). While age of household head,

size of family and being a relative of the husband has a negative impact on the women's empowerment.

To examine the impact of education and employment on the empowerment of women in Pakistan (Riaz &Pervaiz 2018) used household level data from PDHS 2012-13. Women's participation in decision-making regarding her own health care, visit to relatives, spending of husband's income, major household purchases and decisions regarding contraceptive use show women's empowerment. By using Binary Logistic regression (Riaz & Pervaiz 2018) showed that women's education and women's employment had a positive and highly significant impact on the empowerment of women.

The analysis of feminists mobilizing in formulating the gender equality agenda of SDGs has been studied by (Sen 2019) and they argued for the need to locate feminist mobilizing for the SDGs in the context of the history and persistence of gender inequality and violations of girls' and women's human rights, and the struggle against these violations.

The relationship between women's economic, social and demographic status and dimension of women empowerment among married women in Myanmar is analyzed by (Thandar *et al* 2019). The study investigated how these indicators impact women's empowerment by using a logistic model in the data taken from (MDHS). The study (Thandar *et al* 2019) found that educated, employed and wealthier women had a positive association with women's decision-making power. It was also observed by Thandar *et al* (2019) that urban residence, number of children, and women's increasing age gave higher empowerment to women for participating in household decision-making.

The present study takes the definition of women's empowerment as a process that gives control of power and resources, and changes women's lives over time through their active participation in decision-making.

Data Source and Variables Description

To analyze the impact of ICT on women's empowerment, the study has used household level data from PDHS 2017–18 surveyed by National Institute of Population Studies (NIPS) with the funding of USAID. The sample size of 15,675 households was selected, in which 7894 (50.4%) households belonged to urban areas and 7783 (49.6%) to rural areas. Number of women interviewed were 15,068. Ever married woman of age 15–49 is the respondent variable which has been used for our empirical investigation.

The study constructed a variable named as Women Empowerment Index by using indicators of decision making in own health care, household purchases, visits to family and control over husband's earning. The detail definition of variables is given in the Table 1.

The study has taken 'own mobile phone' and 'internet use' as ICT indicators and these are also mentioned in SDGs (goal 5b and goal 17.8), these are our main variables to measure the women's empowerment index. While age, education, employment, region, residence, sex of household head, wealth index, number of alive sons and exposure to media are taken as control variables. Many studies had also taken these socioeconomic and demographic variables (Mahmud *et al* 2012; Akram 2018; Riaz & Pervaiz 2018; Sen 2019; Thandar *et al* 2019).

Pakistan Demographic and Health Survey 2017–18 examines the women's participation in decision into six different categories. These categories are as follows, women take decisions alone, a woman takes a decision jointly with her husband, a woman takes a decision jointly with other family members, a woman's husband takes decision alone, someone else and other/family elders take a decision without consulting the woman. The first three responses in which women participate in decision making will take the value of 1 and suppose that women are empowered to take decisions. The other responses in which women do not have participated will be coded as 0.

Table: 1 Definition of Variables

Variables	Definition
Dependent Variable	
Women's Empowerment Index	WMI is compose of four indicators of decision making. These are participation in decision about own health, household purchases, visit to family or relative and decision on spending of husband's earning. Our dependent variable is binary with value 0-1. Where 0 means no empowerment and 1 means.
Independent Variables	
Own mobile phone	it is a dichotomous variable and label as, 1: if own mobile phone 0: otherwise
Use internet	Use internet is also a dichotomous variable 1: if use internet 0: otherwise

Women's education	Education of respondent women has four categories i.e. 1: if no education, 2: if primary (min 5 yrs.), 3: if secondary (min 10 yrs.) 4: higher education (min 12 years of schooling)
Women's occupation	Women's occupation is divided into 1: if working 0: if not working
Wealth index	Wealth status of women's household measured through score of wealth index. The value of score is 0-4 where 0 if poorest, 1 if poorer, 2 if middle, 3 if richer and 4 if richest.
Husband's education	Education of husband classified into four categories i.e.no education, primary education (minimum 5 years of schooling), secondary education (minimum 10 years of schooling) and higher education (minimum 12 years of schooling).
Husband's occupation	It is binary variable 1: if working 0: if not working
Media	it is also a categorical variable we include frequency of reading newspaper. Frequency of listening radio and frequency of watching TV. With four categories: not at all, occasionally, at least once a week and daily.
Region	Region of Residence used as categorical variable with six possible outcomes depending upon that in which region of the country 1 if Punjab, 2 if Sindh, 3 if Khyber Pakhtunkhwa, 4 if Balochistan, 5 if others.
Residence	Place of residence is a dichotomous variable and has been classified into two categories i.e. urban and rural. Coded as 1, if respondent lives in urban area and coded as 0, if respondent lives in rural area.
Number of alive sons	Number of alive sons is combined with no. of son home and no. of son away. Alive sons= 0 if no son, 1if 1to 2 sons, 2 if 3to 4 sons, 3 if 5 and more sons.
Demographic Indicators	
Sex of household head	Gender of respondent women's household head measured through a dichotomous variable. Coded as 1, if head of household is male and coded as 0 for female headed household.

Women's age	Women's age has been classified into seven categories of seven age cohorts i.e. 15–19, 20–24, 25–29, 30–34, 35–39, 40–44 and 45–49. Thus, it is a categorical variable with seven possible outcomes.
Husband's age	Husband's age is also categorical variable with cohorts. Age=1 if 15-29 =2 if 30-44 =3 if 45-59 =4 if 60-74

Table 2 shows the empowerment status of women with respect to the use of the ICT, the SDGs, socioeconomic and demographic indicators of women empowerment. We have calculated the descriptive statistics of women participation in decision making regarding their own health, visits to family, household purchases and control over husband's earning. From the Table 2, we can see that about 43% women owning mobile phone and 18% women have access to internet in Pakistan. Participation in decision making have been more with respondent who used internet and have mobile phone. Nearly, 57% women have no mobile phone and their participation in decision making are less than 40%, while 43% own mobile phone are more than 50% more empowered and participating all type of decision making at household level.

Table: 2 Empowerment Status of Women

Variables	Percent	Health decision	Financial decision	Purchase Decision	visits decision
Own mobile					
No	56.72	38	34	32	37
Yes	43.28	57	51	50	55
Internet user					
No	82	38	39	38	42
Yes	18	57	54	56	62
Residence					
Urban	48.14	52	46	45	50
Rural	51.86	42	37	35	39

Region					
Punjab	22.56	54	49	48	50
Sindh	18.18	56	55	51	60
Kpk	15.78	29	24	25	29
Baluchistan	11.44	34	23	28	28
Others	32.02	48	42	40	46
Sex of household	89.01	45	40	39	44
Male	10.99	46	50	46	49
Female					

Cont. Table: 2

Empowerment Status of Women (Percentage):

Variables	Percent	Health decision	Financial decision	Purchase Decision	visits decision
Wealth index					
Poorest	19.15	36	32	29	36
Poorer	21.5	41	37	35	38
Middle	19.68	46	42	42	44
Richer	19.1	50	45	44	48
Riches	20.56	58	49	49	57
Sons alive					
0	26.37	40	34	32	36
1-2	50.9	49	43	43	48
3-4	19.09	48	44	43	48
5 and more	3.64	42	38	39	41
Employment					
Not working	83	45	39	38	43
Working	17	58	54	54	57
Education					
No education	50.62	38	34	33	37
Primary	13.96	49	44	43	46
Secondary/higher	35.43	57	49	48	55
Age					
15-19	4.83	22	20	15	18
20-24	14.73	35	29	25	30
25-29	20.88	43	37	35	40
30-34	18.93	50	44	43	48
35-39	18.17	52	47	46	51
40-44	12.09	54	48	51	54

45-49	10.37	57	50	54	57
Media					
No	35.71	34	29	29	33
Yes	64.29	53	47	46	51
Husband's employment					
No	4	41	16	33	38
Yes	96	49	44	42	47
Husband's education					
No education	27.5	42	37	37	40
Primary	13.28	48	43	39	44
Secondary/higher	59.22	52	45	44	50
Husband's age					
15-24	3	29	26	19	25
25-34	27	41	35	33	37
35-44	36	52	47	46	51
45-54	27	58	52	54	59
55-64	6	58	47	54	59
65-74	1	54	39	47	51

Unfortunately, 82% married women do not use internet and their participation in decision making are almost less than 40% in contrast with 18% women who use internet and are more empowered in decision making, as their participation is more than 50%. It has also been noticed that nearly 52% women live in rural areas of Pakistan and their participation level are less compare to 48% women who lived in urban areas. From the given sample, we have seen that 17% respondents are working women and more empowered, they participating in all type of decision making more as compare to not working women. Unfortunately, in Pakistan the majority of women have no education, according to the given sample approximately 51% women are illiterate and their participation level is low as compare to educated women.

The participation level is high for women age 35-49 and also for those women who belong to higher wealth index. More while, women having more than 2 sons are more independent in decision making.

Women having educated husbands have greater extent of empowerment. Moreover, women whose husbands are employed enjoy more empowerment against the unemployed husband.

Methodology

As dependent variable is binary variable, therefore, we use binary logistic regression model to predict the outcome (Akram 2018; Riaz & Pervaiz 2018; Thandar *et al* 2019). Logistic regression analysis has given the concept of odd ratios (OR) which measures the strength and association between the dependent and independent variables. The functional form of model is given below.

WMI = (own mob, use inter, wage, we du, wemp, reg, resid, shhh, wi, alivesons, media, hage, hedu, hemp)

Where WMI is the women's empowerment index. While ownmob is the own mobile phone, useinter is the use internet, wage shows women age, wedu presents women education level and wemp is the women's employment status. Likewise, reg, resi, shh and wi are the region, residence, sex of household head and wealth index.

In this study women's empowerment index has computed by summing following decision-making variables; women's own control over husband's earnings; own decision on major household purchases; own decision on visits to family or relatives and own decision on their health care. The study used binary logistic regression model for women's empowerment index, and other four variables of decision making, by using the same independent variables. Hence the study estimated five categorical binary models through logistic regression estimation technique.

Logit model predicts the probability of success of an event by fitting data to a logit function. The dependent variables in the study are dichotomous which can take the value from 1and 0. Where 1 is for empowerment and 0 for no empowerment.

$P(Y=1) = p_i$

$P(Y=0) = 1-p_i$

The above variables are known as Bernoulli variables, p is for probability of success and 1-p is for probability of failure. Therefore, the binary logistic regression model is formed as:

$Y_i = E(Y|X) + \mu_i$

Since probability is always positive, our equation is in exponential form. As for any value of slope and dependent variable, exponent will never be negative.

$E(Y|X) = p_{i=e}(\beta_0 + \beta_1 X_1 + \cdots \beta_i X_i)$

After dividing the above equation by p+1, to make the probability less than 1, we get the following form at the end.

$$p_i = \frac{1}{1+e^{-(\beta_0+\beta_1 X_1+\ldots\ldots\ldots+\beta_i X_i)}}$$

if p is the probability of success, then 1-p will p probability of failure. Therefore, we divide both sides of above equation by 1-p. we get

$$\frac{pi}{1-pi} = e^{(\beta_0 + \beta_1 X_1 + \cdots \beta_i X_i)}$$

Taking the log of the above equation, we have

$$L\left(\frac{pi}{1-pi}\right) = \beta_0 + \beta_1 X_1 + \ldots\ldots\ldots\ldots\ldots + \beta_i X_i + \mu_i$$

While $\frac{pi}{1-pi}$ is the Odd Ratio

β_0 is the constant, β_i are the coefficients of the variables X_i and μ_i is the error term.

Empirical Results

The results of logistic regression model in which dependent variable is empowerment index has been shown in the Table 3. The estimation results showed that the ICT indicators (mobile phone and use of internet) which are also crucial indicators of SDGs for achieving women's empowerment have a positive association and highly statistically significant.

Further, the results indicate that odd ratios of women empowerment for owning a mobile phone are 1.6 times as large as the odds for women with no mobile phone, controlling for other factors. Likewise, women using internet are 1.2 times more empowered than with those who have no access to internet, controlling for other factors. This positive association also helps in achieving SDGs target 2030. Currently employed women are 1.7 times more empowered than non-working women, controlling for other factors and it is also highly significant with positive sign our results are consistent with (Akram 2018; Thandar 2019). It is also interesting to note that women with any education level primary and secondary or higher is positive and significant association. It is worthwhile to note that odd ratios for educated women are 1.2 and 1.3 times shows more empowerment than women with no education level, control other factors.

Table 3: ICT-SDGs indicators of WMI among women age 15-49

EMPOWERMENT_INDEX	OR	Std.Err.	z	P>z
own mobile	1.601***	.071	10.44	0.000

internet user	1.313***	.084	4.23	0.000
employment	1.775***	.103	9.92	0.000
EDUCATION				
Primary	1.23***	.074	3.23	0.001
Secondary/higher	1.314***	.075	4.78	0.000
AGE				
20-24	1.349***	.211	2.39	0.017
25-29	1.981***	.256	5.29	0.000
30-34	2.643***	.354	7.25	0.000
35-39	2.984***	.416	7.83	0.000
40-44	3.862***	.574	9.08	0.000
45-49	4.869***	.758	10.16	0.000

Cont. Table 3:

EMPOWERMENT_INDEX	OR	Std.Err.	z	P>z
WEALTH_INDEX				
poorer	1.197***	.077	2.78	0.005
middle	1.174**	.084	2.25	0.025
richer	1.088	.086	1.08	0.280
richest	1.077	.093	0.86	0.392
RESIDENCE				
rural	.854***	.038	-3.55	0.000
REGION				
sindh	1.604***	.095	7.94	0.000
kpk	.398***	.026	-14.00	0.000
balochistan	.454***	.035	-10.38	0.000
others	.727***	.037	-6.18	0.000
SEX_HOUSEHOLD_HEAD				
female	1.884***	.118	10.11	0.000
media	1.341***	.064	6.10	0.000
SONS_ALIVE				
1. 1-2	1.136**	.056	2.60	0.009
2. 3-4	1.074	.069	1.11	0.265

3. 4 and above	.791**	.088	-2.11	0.035
HUSBAND_EDUCATION				
1. Primary	.862**	.056	-2.29	0.022
2. Secondary/Higher	.921*	.048	-1.60	0.109
HUSBAND_AGE				
25-34	1.093*	.111	0.88	0.381
35-443	1.347**	.151	2.66	0.008
45-54	1.491***	.186	3.21	0.001
55-64	1.579***	.241	3.04	0.002
65-74	1.667**	.476	1.79	0.073
Husband_employment	1.449***	.127	4.24	0.000
constant	.0911***	.015	-14.74	0.000

Odds ratios in the Table 3 indicate that women age 20-49 are 2 to 4.8 times more likely, to have high empowerment level compared with women age 15-19, controlling for other factors. Residence has a negative and statistically significant association, which shows that odd for rural women are 8 times less than urban women, by controlling other factors. Likewise, Sindh region has positive and significant association and odds are 1.6 times for women in Punjab region, while respondent who lived in KPK, Baluchistan and other region's odds are 0.4, 0.4 and 0.7 times less than who lived in Punjab, controlling for other factors. The number of alive sons (1-2) has a positive association and is statistically significant at the 5% levels. Compared with women with no son, women with one or two sons are 1.36 times more likely to have a high empowerment level, controlling for other factors. Men's educations of primary, secondary or higher levels are statistically significant at the 5% and 1% levels, respectively. Women whose husbands have an education at the primary, secondary or higher levels are 0.86 and 0.92 times less likely, to have a high empowerment level compared with husband with no education level, controlling for other factors.

Table 4: Estimating Results of Participation in Decision-making:

	Decision Health	Decision Visits	Decision Purchases	Decision Financials
Own_mobile	0.438***	0.419***	0.503***	0.453***
	-1.55	-1.521	-1.654	-1.573
Internet_user	0.274***	0.312***	0.277***	0.11
	-1.315	1.367	-1.319	-1.116

Employment	0.530***	0.539***	0.619***	0.516***
	-1.699	-1.714	-1.857	-1.67 *
Education				
Primary	0.210***	0.186**	0.224***	0.166**
	-1.234	-1.204	-1.251	-1.18
secondary or higher	0.360***	0.375***	0.271***	0.247***
	-1.433	-1.455	-1.311	-1.281
Age				
20-24	0.440***	0.465***	0.358**	0.245*
	-1.552	-1.602	-1.43	-1.277
25-29	0.694***	0.792***	0.742***	0.510***
	-2.001	-2.21	-2.099	-1.665
30-34	0.881***	1.025***	1.030***	0.726***
	-2.413	-2.811	-2.8	-2.067
35-39	1.005***	1.196***	1.185***	0.890***
	-2.731	-3.305	-3.271	-2.435
40-44	1.245***	1.444***	1.528***	1.065***
	-3.571	-4.24	-4.611	-2.9001
45-49	1.434***	1.695***	1.683***	1.262***
	-4.212	-5.44	-5.382	-3.532

Cont. Table 4:

Estimating Results of Participation in Decision-making:

	Decision Health	Decision Visits	Decision Purchases	Decision Financials
WEALTH_INDEX				
Poorer	0.111	0.0829	0.193**	0.198**
	-1.121	-1.086	-1.213	-1.218
Midle	0.0524	0.0231	0.217**	0.150*
	-1.103	-1.023	-1.242	-1.161
Richer	-0.0257	-0.075	0.083	0.077
	-0.974	-0.927	-1.086	-1.08
Richest	0.0546	-0.022	-0.009	-0.046

	-1.101	-0.978	-1.086	-0.955
RESIDENCE				
Rural	-0.131**	-0.174***	-0.177***	-0.155***
	-0.877	-0.84	-0.991	-0.857
REGION				
Sindh	0.300***	0.661***	0.388***	0.464***
	-1.35	-1.941	-0.837	-1.591
Kpk	-0.938***	-0.777***	-0.924***	-1.015***
	-0.391	(0..459)	-1.474	-0.362
Balochistan	-0.478***	-0.651***	-0.546***	-0.917***
	-0.619	-0.521	-0.396	-0.399
Others	-0.265***	-0.212***	-0.382***	-0.324***
	-0.766	-0.809	-0.579	-0.723
SEX_HOUSEHOLD_HEAD				
Female	0.666***	0.469***	0.560***	0.708***
	-1.946	-1.598	-0.682	-2.029
Media	0.337***	0.310***	0.305***	0.348***
	-1.401	-1.363	-1.751	-1.416
SONS_ALIVE				
1-2	0.115*	0.201***	0.145**	0.142**
	-1.122	-1.223	-1.357	-1.152
3-4	0.0258	0.122	0.098	0.189**
	-1.0261	-1.13	-1.155	-1.208
5 and above	-0.195	-0.227*	-0.13	-0.067
	-0.823	-0.796	-1.103	-0.934

Cont. Table 4:
Estimating Results of Participation in Decision-making:

	Decision Health	Decision visits	Decision Purchases	Decision Financials
HUSBAND_EDUCATION				
Primary	-0.118	-0.018	-0.124	-0.003

	-0.888	-0.971	-0.878	-0.997
Secondary or higher	-0.0525	0.0114	-0.055	-0.032
	-0.949	-1.011	-0.946	-0.968
HUSBAND_AGE				
25-34	-0.0285	-0.03	0.106	-0.098
	-0.971	-0.971	-1.111	-0.906
35-44	0.162	0.222*	0.267*	0.056
	-1.175	-1.249	-1.306	-1.057
45-44	0.239*	0.322**	0.348**	0.127
	-1.269	-1.38	-1.416	-1.135
55-64	0.319*	0.413**	0.396**	0.104
	-1.376	-1.511	-1.485	-1.109
65-75	0.393	0.367	0.374	0.167
	-1.482	-1.442	-1.453	-1.181
husband employment	0.144	0.256**	0.211*	1.376***
	-1.154	-1.301	-1.234	-3.958
Constant	-2.325***	-2.925***	-3.114***	-4.743***
	-0.097	-0.121	-0.102	-0.057
N	14451	14451	14451	14451

We have estimated four different models, participation in decision making at household level through visits to family and friends, household purchases, spending of husband earning and decision about her own healthcare are taken as dependent variables. These models have been estimated through binary logit technique as all dependent variables are dichotomous. the results of these four models are given in Table 4. Our estimations indicate that own mobile phone and internet user have positive and significant impact on women participation in decision-making in all categories. By owning mobile and using internet will increase the decision-making power of women at household level.

Employment status, education level and age have positive and significant impact on participation in decision making indicators and our results are consistent with other studies (Akram 2018; Riaz & Pervaiz 2018; Thandar 2019). Moreover, urban residence, region and media have positive association with women's participation in all level of decision-

making. It has been seen that number of sons alive from 1-4 have positive association with all level of decision making but more than four have not found to be significant.

In our estimation results of all four model's husband's age, husband's education level and husband's employment status have almost not found significant impact on women's participation in decision making indicators at household level.

Conclusion

The study has investigated the impact of ICT on women's empowerment in Pakistan by using household level data from PDHS 2017-18. The indicators of women's participation in decision making indicators have been used to construct women empowerment index. Women's participation in their own healthcare, visits to family and friends, household major purchases and control over husbands earning are converted in to women's empowerment index and used these five variables as dependent variable. The dependent variable is binary and we use logistic regression model for our analysis. We include several control variables like employment, education, age, residence, region, number of alive sons, media and wealth index.

Our empirical results show that ICT has strong positive and significant impact in women's empowerment, after controlling socioeconomic and demographic predictors. This implied importance and enhanced role of the ICT to achieve SDGs 2030 for empowering women. The estimation has shown that women with employment status, education level, in a middle wealth quintile, and with urban residence show a higher level of participation in decision-making and hence are empowered. It has also found that women with one or two sons tend to be have a higher level of women's empowerment than women without any son and also women who lived in Punjab and Sindh region are supposed to be more empowered than women lived in other regions.

Our results also examined that own mobile phone, use of internet, employment and education which are also very crucial indicators of SDGs have positive and significant association with women's empowerment. Most important is that ICT will help in reducing gender inequality which in turn helps in achieving SDGs 2030. According to the findings, it is recommended that there should be easy and frequent access and the use of ICT for women. It is also suggested that there should be increase the number of women in work force and give more focus on women education.

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