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Determinants of Mass Media Exposure and Involvement in Information and Communication Technology Skills among Bangladeshi Women

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Abstract

Nowadays, it is clear that access to different media along with information and communication technology (ICT) enhances the overall development of a countries. Women empowerment plays a key role in poverty reduction as well as ensuring sustainable development. The purpose of this paper is to assess the status of media exposure i.e., radio, television, print/electronic media and ICT skills along with finding out the potential determinants of the media exposure and ICT skills by women aged 15-49 years in Bangladesh considering the MICS-2019 dataset. Among the three media, the findings reveal that television is very popular than newspaper and radio. Young women are more exposed to mass media, however, fewer ICT skills compared to adult women. The findings also disclose that age, education, marital status, living area, geographical location, overall happiness and wealth index are significantly linked with the status of mass media exposure as well as ICT skills of women in Bangladesh. Therefore, it is essential to take necessary steps to enhance the mass media exposure and increase the rate of ICT skills among women who lived in urban and rural areas to become self-confident as well as independent which will be helpful to accelerate the SDGs 4, 5 and 16 goals by ensuring 4.3, 4.4, 5.1, 5.b, and 16.10 targets in Bangladesh by 2030.

Keywords: Women reproductive age; Media exposure; Logistic regression; ICT communication skills.

1. Introduction

Bangladesh is trying to attain gender equality along with women empowerment to make sure the Sustainable Development Goals (SDGs) by 2030 (United Nations, 2015). Bangladesh is one of the heavily populated countries and its population is estimated 162.7 million, among them there are 81.3 million and 81.4 million women and men respectively in 2017 (Akhter Asma & Islam, 2019). In rural area, the percentage of women are higher than men, however, the scenario is different in urban area i.e., the ratio of women and men are almost same (Akhter Asma & Islam, 2019). The government established a national web gateway comprising 46,500 government offices and 5,875 Digital Centres as part of the a2i program to assure people's easy access to public services. Through the 4,571 Union Digital Centres, even individuals in remote areas can access a variety of services online. To meet the industry's human

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resource needs, the government has been working to generate educated experts in order to increase the number of IT professionals to 2 million by 2021. Furthermore, there are approximately 0.5 million freelancers that work on outsourcing projects (Bangladesh Planning Commission, 2020).

Nowadays, exposure to different print/electronic media plays a vital role to change norms, behaviours and habits human beings (Dasgupta, 2019). Media is helpful to create awareness regarding domestic violence as well as may be play a positive role to change the status of women like independent and empowered women, especially in low-literate backgrounds (Jesmin & Amin, 2017). Moreover, both political and job opportunities may also be circulated through mass media designed for women folk (Bhushan & Singh, 2014). Previous studies found that radio, television, and/or print media is potential to change gender norms associated to violent behaviour towards women (Bhushan & Singh, 2014; Bhattacharya, 2016; Jesmin & Amin, 2017). Ting, et al. (2014) show that exposure to different mass media strongly and positively influence women's regarding their rights and empowerment (Ting et al., 2014). Furthermore, throughout the previous few decades, campaigns available on different media have been utilized as an endeavour to improve numerous behaviours related to health among general populations (Robinson et al., 2014).

Along with mass media, the usage and execution of information and communication technologies (ICTs) have impacted to revolutionary economic as well as social transformation throughout the World (Unwin, 2009, 2010; Karim et al., 2011; Castells, 2013; Mukerji, 2013; Sey et al., 2013). However, Ullah (2017) claims that the empowerment due to ICTs does not achieved automatically following their complete implementation (Ullah, 2017). Unfortunately, women lived in rural areas have the less right and access to the technology (Rashid et al., 2010). However, to ensure the development of women, ICTs offers a wide-ranging opportunities which contribute positively for the gender equality (Afrah & Fabiha, 2017; United Nations Division for the Advancement of Women, 2005). Women are gradually more adopting ICT skills for numerous business associated tasks and enhance their knowledge of communication, marketing, purchasing etc. in different parts of the World (Ndubisi & Kahraman, 2005). Statistics reveal that individuals living in developing countries own up fewer computers, mobile phones and phone lines than developed countries (James, 2007). Women empowerment is one of the crucial basic elements of poverty reduction as well as ensuring sustainable development (Fox & Romero, 2017). Several previous studies conducted is several countries pointed out that, the utilization of ICT may be positive for the empowering women economically (Prasad & Sreedevi, 2007).

If Bangladeshi women were educated along with enabled to enrich their knowledge by various ICT tools, for example, mobile/smart phones, computers, and the internet then the level of poverty could be lessened and development/advancement would be achievable in economic, social, and every sectors of a person's life (Laizu et al., 2010). In Bangladesh, ICT can perform as a vital role in changing the lifestyle

of women both in urban and rural regions through making them confident and self-independent (Laizu et al., 2010). Moreover, Ashraf el al., (2009) pointed out that the community participants accept the modern and advanced ICT knowledge and skills in the interior of their social as well as economic constraints (Ashraf et al., 2009). Considering the necessity, the present Government of Bangladesh are emphasizing on ICT sector and try to visualize Bangladesh as a "Digital Bangladesh by 2021" where information and communication technology is undoubtedly playing the magical role. However, Islam and Grönlund (2011) mention that there is an evidence of progressing slowly toward materializing a "Digital Bangladesh" (Islam & Grönlund, 2011).

Over the last couple of years there is a significant advancement observed in ICT sector of Bangladesh. To develop a digital society i.e., an ICT driven knowledge-based society, the present government is trying to facilitates people in different aspects. However, to make sure the SDSs it is necessary to involve women in the ICT sectors where they can be acting as a crucial role in family, community as well as social development. Moreover, it is essential to explore the factors that influence women to participate ICT activities. Therefore, the authors intended to assess the status of media exposure and ICT skills as well as to find the potential determinants of the media exposure and selected ICT activities by women aged 15-49 years in Bangladesh.

2. Methodology

2.1 Data

The data were taken from Multiple Indicator Cluster Survey-2019 (MICS-2019). Briefly, the 2019 MICS is considered a country wide and fully representative sample survey in Bangladesh conducted by BBS with the collaboration of UNICEF that provided information on different indicators of the eight administrative divisions of Bangladesh. The MICS utilized a two-stage stratified sampling procedure for collecting the required information. Firstly, the districts were taken as the primary sampling strata, as well as a number of census enumeration areas (EAs) were selected from every stratum. Then a systematic sample of 20 families was taken from every EA. This survey include 64,400 respondents. However, the missing observations were excluded from this study. Therefore, the subsequent analysis of this study is based on N=64,377 women in 2019 (Bangladesh Bureau of Statistics (BBS) & UNICEF Bangladesh, 2019).

2.2 Variables

The paper considers two target variables viz. media exposure and selected ICT skills. The first target variable is whether there is a media exposure (exposed to any media e.g., newspaper, radio and television at least once a week) or not and coded as "0" for no exposure and "1" for any exposure or Yes. To fulfil the objective of the research and simplicity of analysis, the answers to the questions on

"frequency of listening to radio, reading newspaper and watching television" were categorized as follows: almost every day, at least once a week, less than once a week = 1 and not at all = 0. Hence, any respondent who chosen at least one 'yes' for all the three was considered as exposed to mass media and assign a value "1" and those who chosen 'no' for all the three questions were judged as no exposed to mass media and coded as "0".

However, the second outcome variable is the status of ICT skills i.e., involvement of selected ICT activities by women and is determined by completed at least one of the following nine itemized computer associated activities available in the MICS-2019 dataset and assigned 0 for "No" and 1 for "Yes" (Bangladesh Bureau of Statistics (BBS) & UNICEF Bangladesh, 2019).

> (i) "Copied or moved a file or folder"; (ii) "Used a copy and paste tool to duplicate or move information within a document"; (iii) "Sent e-mail with attached file, such as a document, picture or video"; (iv) "Used a basic arithmetic formula in a spreadsheet"; (v) "Connected and installed a new device, such as a modem, camera or printer"; (vi) "Found, downloaded, installed and configured software"; (vii) "Created an electronic presentation with presentation software, including text, images, sound, video or charts"; (viii) "Transferred a file between a computer and other device"; (ix) "Wrote a computer program in any programming language".

This study is intended to identify the association between the status expose to mass media, and status of ICT skills determined by several ICT activities by women with several socio-economic and demographic variables. The independent variables included in the analysis are: women reproductive age, geographical division (Barishal, Chattogram, Dhaka, Khulna, Mymensingh, Rajshahi, Rangpur, and Sylhet); educational status (pre-primary or none, primary, secondary and higher secondary+); currently married (yes, no); ethnicity of household head (Bengali, others (Chakma, Santal, Marma, Tripura, and Garo)); having functional difficulties (yes, no); place of living (urban, rural); overall happiness (very happy, somewhat happy, neither happy nor unhappy, somewhat unhappy, very unhappy); wealth index (poorest, poorer, middle, richer, and richest). The selection of variables used in this study was motivated by the availability in the MICS dataset and self-efficacy as well as guided by relevant literature(Ahinkorah et al., 2020; Dasgupta, 2019; Fatema & Lariscy, 2020; Rabbi, 2012; Ullah, 2017; Yaya et al., 2018).

Analysis

The percent distribution of different variables is calculated. Besides, the bivariate analysis (χ^2 -test) is performed to determine the significant associations between the target variables and selected socio-demographic factors. Moreover, the association of the household ownership of different ICT equipment as well as accessibility of internet with several characteristics of the respondents were done. These associated variables were considered as the independent variables for the logistic regression model

(adjusted), which was carried out in this study to find out the determinants of the status of media exposure and identify the most influential factors for involving ICT activities by women. The general form of a logistic regression model can be expressed as,

$$\Pr\left(Y_i = 1\right) = \frac{\exp\left(X_i\beta\right)}{1+\exp\left(X_i\beta\right)}$$

where, Y_i takes a value of '1' if the respondent is having media exposure/participate to the selected ICT activities and '0' otherwise, X_i is a vector of covariates and β is a vector of parameters which contains the intercept parameter and the regression parameters associated with a set of covariates used in the study. The fitted form of the model can be defined as,

$$\ln\left[\frac{\hat{P}_i}{1-\hat{P}_i}\right] = \hat{\beta}_0 + \hat{\beta}_1 X_1 + \ldots + \hat{\beta}_k X_k ,$$

where, $\hat{\beta}_l$ $(l = 0,1,2,\ldots,k)$ represents the estimated regression coefficient of the l^{th}independent variable in the study.

3. Results

The mass media acting as a vital sources of information as well as exposure to latest and new thoughts. The media also play as a significant role in a country where females have no or low education, fewer opportunities of employment outside the home, or employment on the family owned farm, or even limited autonomy of movement. Moreover, media exposure can be noticed as a cause of "empowerment" for women just like education. The percent distribution of exposed to mass media of 15-49 years old women are presented in **Table 1** along with different selected demographic and socio-economic characteristics. The results describe that the age and education of the participants are crucial for determining the status of media exposure to all three media individually as well as jointly. Among the three media, the findings reveal that television is very popular than newspaper and radio. There is an adverse association between age and rate of use media e.g., the highest number of women watch television (63.5%), listen to the radio (2.7%) of age 15-19 years and read a newspaper (5.6%) of age 20-24 years. Among the age group of women, 45-49 years of aged women have the lowest percentage of listening to the radio (0.47%) and watching television (55.7%). Higher educated women are more exposed to media. It is seen that more than one-fourth of women having education of higher secondary level or above use any media, however, less than half of the women whose educational status is none or pre-primary use any media among the three. Moreover, unmarried women and has no functional difficulties use more mass media than their counterpart [**Table 1**].

Table 1. The Percent Distribution of Exposed to Mass Media of 15-49 Years Old Women

Characteristics	One or more times in a week (%)				
	Read a newspaper (a)	Listen to the radio (b)	Watch television (c)	Any media (d)	All three media (e)
Age (in years) [a, b, c, d, e:*]**					
15-19	5.01	2.72	63.52	65.41	2.30
20-24	5.61	2.04	62.95	64.63	2.74
25-29	4.74	1.09	62.44	63.49	2.14
30-34	3.12	0.61	60.75	61.39	1.52
35-39	3.20	0.58	58.29	58.90	1.82
40-44	3.44	0.51	57.69	58.22	1.82
45-49	2.85	0.47	55.73	56.16	1.63
Education [a, b, c, d, e:*]**					
Pre-primary or none	0.1	0.16	43.33	43.52	0.15
Primary	0.3	0.39	52.06	52.38	0.14
Secondary	2.2	1.15	65.06	65.98	1.01
Higher secondary+	18.7	3.89	77.93	81.28	9.28
Currently married [a, b, c, d, e:*]**					
Yes	3.04	0.80	59.81	60.56	1.49
No	8.48	3.15	64.39	66.71	4.21
Has functional difficulty [a:, b:NS, c:***, d:***, e:NS]**					
Yes	3.15	1.24	49.18	50.03	1.75
No	4.09	1.08	60.62	61.60	2.03
Ethnicity of household head [a: NS, b: *, c:***, d:***, e:**]**					
Bengali	4.14	1.29	61.23	62.29	2.06
Others	3.91	0.40	40.19	40.98	1.33
Overall happiness [a, b, c, d, e:*]**					
Very happy	7.73	1.97	70.90	72.53	3.81
Somewhat happy	3.08	1.07	59.84	60.75	1.54
Neither happy nor unhappy	1.93	0.95	47.06	47.76	0.92
Somewhat unhappy	1.18	0.62	44.49	45.04	0.50
Very unhappy	1.94	0.28	43.15	43.80	0.65
Living area [a, b, c, d, e:*]**					
Urban	11.06	2.47	80.17	81.34	6.26
Rural	2.38	0.97	55.80	56.83	0.97
Division [a, b, c, d, e:*]**					
Barishal	2.67	1.80	37.25	38.91	1.22
Chattogram	4.82	0.81	55.92	57.09	2.11

Characteristics	One or more times in a week (%)				
	Read a newspaper (a)	Listen to the radio (b)	Watch television (c)	Any media (d)	All three media (e)
Dhaka	5.56	2.12	73.59	74.63	3.49
Khulna	4.12	1.17	67.16	68.15	1.88
Mymenshing	4.02	0.72	57.88	59.08	1.47
Rajshahi	3.11	1.57	69.19	69.85	1.81
Rangpur	3.10	0.77	54.94	55.77	1.19
Sylhet	3.63	0.49	49.76	50.97	1.38
Wealth Index [a, b, c, d, e:*]**					
Poorest	0.52	0.61	21.09	22.10	0.11
Poorer	1.05	0.74	51.39	52.29	0.36
Middle	1.87	0.85	67.07	68.01	0.69
Richer	3.78	1.51	78.74	79.87	1.53
Richest	14.96	2.87	89.29	90.66	8.39

Note: NS: Not significant; *, **, ***: Significant at 10%, 5% and 1% level respectively

The status of overall happiness is also highly significantly linked with the status of exposure to several mass media. The percentage of reading newspapers for the very happy women is about four times more than very unhappy women. The percentage of watching television by very happy women is approximately half of the very unhappy women. It is observed that women whore sided in rural regions are less exposed to mass media than women who currently lived in urban regions. For example, 11.1% percent of urban women read a newspaper but only 2.4% of rural women read a newspaper. About 60% and more than 80% of women use any media (newspaper, radio, or television) who lived in rural and urban areas respectively. The highest number of respondents who lived in the Dhaka division (74.6%) are more exposed to mass media (newspaper, radio or television) and the lowest number of women are lived in the Barishal division (38.9%). Moreover, women who are not financially solvent are less exposed to mass media. Only 22.1% of the poorest women use any media, however, just above 90% of women use any media whose wealth status is richest. This scenario is similar for all three media. The findings reveal that living area, geographical location and wealth status are significantly linked with the status of mass media exposure of women whose age lies between 15 to 49 years [**Table 1**].

The ownership of different ICT equipment like television, mobile, computer along with access to the internet according to several selected background characteristics is presented in **Figure 1**. It is seen that the percentage of the ownership of television, computer and internet access is almost equal for all age groups. The percentage of ownership of television, computer and access to the internet are about 50%, 5% and 35% respectively. However, the ownership of mobile phones varies among age categories, for example, the percentage of ownership of mobile phones is about 80% for 25-34 years of women and the lowest percentage is for age groups of 15-19 years. The results depict that more than 85% of women

have a mobile phone with an education level higher secondary or above while 57.2% of illiterate or pre-primary educated women have a mobile phone. Women who lived in urban regions use more mobile phones than women who lived in rural parts of Bangladesh. The percentage of ownership of television is almost equal for all the categories of wealth index. A little bit higher percentage is observed in the ownership of computer and access to internet among the rich people compared to poor people. However, the rate of ownership of mobile phones is about 20% more among the richest women compared to poorer women **Figure 1**.

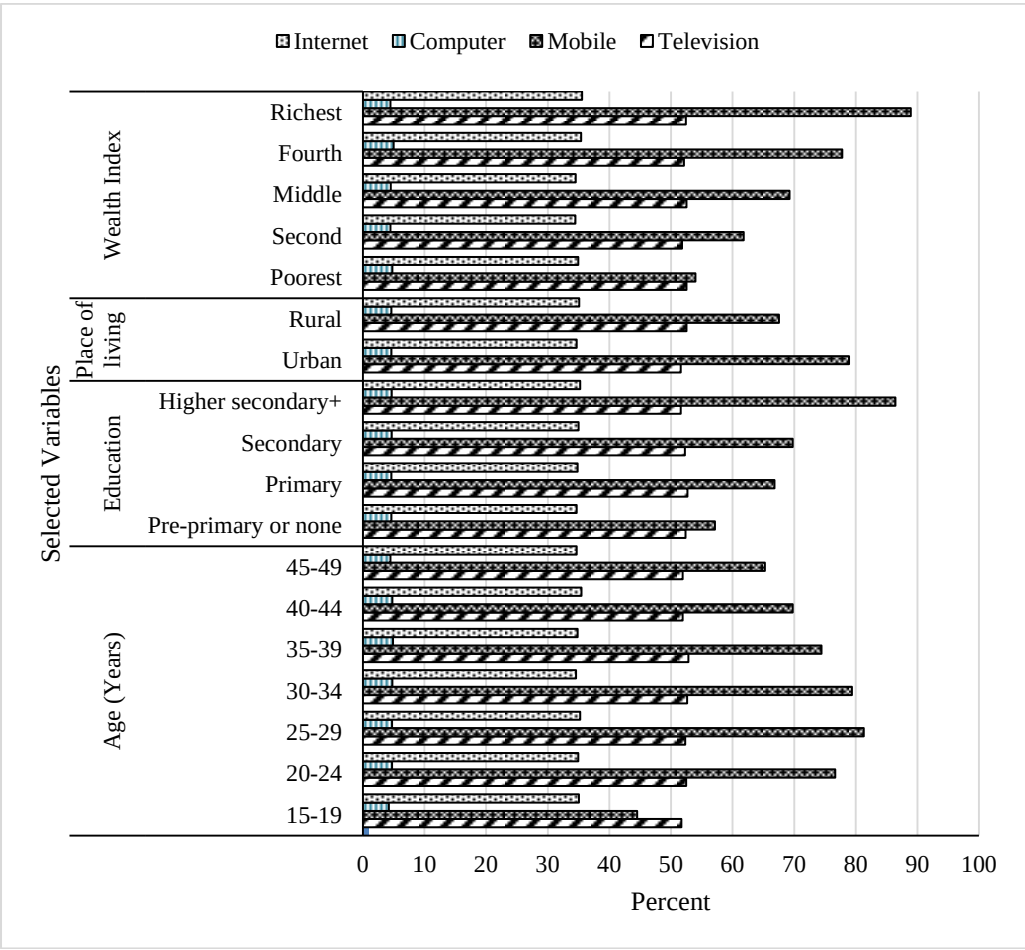

Figure 1. Ownership of ICT-Equipment along with Access to Internet by Selected Variables

Table 2. Results of Logistic Regression of the Status of Media Exposure and ICT Skills along with Selected Covariates

Characteristics	Labels	Media exposure		ICT skills	
		B	AOR (95% CI)	B	AOR (95% CI)
Age (in years)	15-19 (Ref.)				
	20-24	0.08	1.08 (1, 1.18)*	-0.23	0.8 (0.46, 1.4)
	25-29	0.16	1.17 (1.07, 1.27)***	-0.28	0.76 (0.41, 1.39)
	30-34	0.13	1.14 (1.05, 1.25)***	0.29	1.34 (0.63, 2.84)**
	35-39	0.04	1.04 (0.95, 1.13)	0.16	1.17 (0.51, 2.67)*
	40-44	0.02	1.02 (0.92, 1.12)	0.01	1.01 (0.43, 2.38)
	45-49	-0.11	0.89 (0.81, 0.99)**	0.85	2.33 (0.7, 7.73)**
Education	None or primary (Ref.)				
	Secondary	0.31	1.36 (1.28, 1.45)***	1.56	4.75 (0.47, 8.17)*
	Higher secondary+	0.60	1.82 (1.67, 1.98)***	2.14	8.52 (2.38, 15.18)*
Currently married	Yes (Ref.)				
	No	0.20	1.22 (1.14, 1.31)***	0.63	1.88 (1.25, 2.83)***
Functional difficulties	Yes (Ref.)				
	No	0.17	1.19 (1.06, 1.33)***	-0.07	0.93 (0.17, 5.12)
Ethnicity of household head	Bengali (Ref.)				
	Other	0.56	1.76 (1.53, 2.02)***	-0.28	0.75 (0.2, 2.84)
Overall happiness	Very happy (Ref.)				
	Somewhat happy	-0.02	0.98 (0.93, 1.03)	-0.27	0.76 (0.54, 1.09)**
	Neither happy nor unhappy	-0.30	0.74 (0.69, 0.79)***	0.11	1.12 (0.39, 3.2)
	Somewhat unhappy	-0.38	0.68 (0.6, 0.77)***	-0.11	0.9 (0.06, 12.49)*
	Very unhappy	-0.36	0.7 (0.6, 0.82)***	-0.92	0.4 (0.05, 3.47)**
Place of living	Urban (Ref.)				
	Rural	-0.48	0.62 (0.58, 0.65)***	-0.09	0.92 (0.62, 1.35)*
Division	Barishal (Ref.)				
	Chattogram	0.17	1.19 (1.1, 1.29)***	0.72	2.06 (0.88, 4.83)*
	Dhaka	0.96	2.62 (2.41, 2.85)***	0.95	2.59 (1.16, 5.78)**
	Khulna	0.89	2.44 (2.25, 2.65)***	0.97	2.62 (1.11, 6.2)**
	Mymenshing	0.94	2.56 (2.3, 2.85)***	0.48	1.61 (0.58, 4.44)
	Rajshahi	1.16	3.19 (2.91, 3.48)***	0.17	1.18 (0.5, 2.78)*
	Rangpur	0.80	2.23 (2.04, 2.43)***	1.74	5.7 (1.97, 16.53)***
	Sylhet	-0.04	0.96 (0.87, 1.06)	0.38	1.46 (0.53, 4.01)*
Wealth index	Poorest (Ref.)				
	Poorer	1.25	3.5 (3.29, 3.71)***	0.92	2.51 (0.24, 26.52)
	Middle	1.91	6.76 (6.35, 7.19)***	1.04	2.83 (0.05, 2.36)*

Characteristics	Labels	Media exposure		ICT skills	
		B	AOR (95% CI)	B	AOR (95% CI)
	Richer	2.16	8.67 (7.92, 9.54)***	0.82	2.27 (0.07, 2.79)**
	Richest	2.25	9.44 (8.42, 13.14)***	0.55	1.74 (0.09, 3.6)**
Constant		-1.87		-2.12	

Note: AOR: Adjusted odds ratio; CI: Confidence interval; *, **, *** represents significant at 10%, 5% and 1% level respectively

The results of logistic regression of media exposure status and status of ICT skills are presented in **Table 2**. It is observed that age, education, marital status, status of functional difficulties, overall happiness, geographical location of residence and wealth index are highly significant factors for the status of media exposure of women. The women of age 25-29 years have 17% (AOR: 1.17, 95% CI: 1.07-1.27) higher chance to expose to mass media compared to 15-19 years aged women, however, about 11% (AOR: 0.89, 95% CI: 0.81-0.99) less chance of using mass media by women of aged 45-49 years compared to 15-19 years aged women. The likelihood of media exposure is 1.82 times more (AOR: 1.82, 95% CI: 1.67-1.98) of women having higher secondary and above education compared to illiterate or primary educated women. Moreover, very unhappy women and lived in rural are less exposed than very happy women who resided in urban areas. With region, the highest likelihood of mass media exposure is observed in the Rajshahi division (AOR: 3.19, 95% CI: 2.91-3.48) and less exposed in the Sylhet division (AOR: 0.96, 95% CI: 0.87-1.06) as compared with the Barishal division. The richer (AOR: 8.67, 95% CI: 7.92-9.54) and richest (AOR: 9.44, 95% CI: 8.42-13.14) women have more than 8- and 9-fold higher odds for media exposure compared to the poorest women.

On the other hand, young women having fewer ICT skills than adult women. For example, women aged 25-29 years (AOR: 0.76, 95% CI: 0.41-1.39) have less odds compared to 15-19 years aged women but women aged 45-49 years (AOR: 2.33, 95% CI: 0.7-7.73) having 2.33 times higher likelihood of have ICT skills compared to age the group 15-19 years. Higher educated (e.g., Secondary education: AOR: 4.75, 95% CI: 0.47-8.17; Higher secondary and above: AOR: 8.52, 95% CI: 2.38-15.18) women are very likely to have ICT skills than illiterate primary educated women. Married women have more chances of having ICT skills than unmarried women. Also, unhappy women and lived in rural areas have a smaller amount of ICT skills than happy women who resided in urban areas. Most of the women who settled in other divisions have more odds compared to women who stayed in the Barishal division. Women who come from middle-class families (AOR:2.83, 95% CI: 0.05-2.36) hove the highest likelihood of ICT skills than women who come from the poorest families [**Table 2**].

4. Conclusion

This study targeted to examine the potential determinants for the status of media exposure and ICT skills among women in Bangladesh. The findings reveal that age, education, marital status, living area,

geographical location, overall happiness and wealth status are significantly linked with the status of mass media exposure of women aged 15-49 years of Bangladesh. Since, the employment opportunities is gradually increasing in the ICT sector, and play as a potential factor for both national as well as international development so without its adoption, there will be a incredibly limited scope for development in both regional as well as national level. Therefore, government should design special plan and policies on infrastructural and financial supports and enhance the training facilities in school to encourage and improve the practice of ICT skills among girls besides women in urban and rural areas to become self-independent as well as self-confident which will be helpful to accelerate the achieving rate SDGs 4, 5 and 16 goals by ensuring 4.3, 4.4, 5.1, 5.b, and 16.10 targets.

Ethical Approval

This study used secondary data which is accessible through online upon a request from the data repository of MICS surveys as a result of ethical approval from our respective institutions was not required. The MICS taken all required ethical approval from the respective ethical review board prior to the collection of data.

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