

# An Observational Study to Understand the Attitude of Elderly towards Communication and Education Technology, in New Delhi, India

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**ABSTRACT:** Globally there is a rapid growth of population aged 65 years and above. The pace of the ageing population is much faster in developing countries, like India, as compared to developed countries. This demographic change will increase demand for aged care services in the future in India and hence will require increased use of technology to deal with increasing demand for long term elderly care. It is very important for the developers of technology for elderly care to understand the attitude of elderly towards the technology in India before introducing technology at large scale. There is a dearth of literature to understand the attitude of the elderly towards information and communication technology in developing countries. Hence the objective of this study is to understand the attitude of elderly towards communication and education technology in India.

**Methodology:** The study has been conducted involving 300 elderly participants from semi-urban areas in New Delhi. The survey had been conducted using a questionnaire which is based on the International Classification of Functioning, Disability and Health (ICF). A descriptive statistical analysis (mean, frequency, standard deviation and percentage) was performed to examine the distribution of each variable.

**Result:** A total of 360 participants were screened and 335 participants selected after HMSE test. We received 300 responses (149- Male, 151- Female), overall response rate of 89.5% (49% male and 51% female). Overall 240 (80%) respondents were positive about using both education and communication technology. There was a significant difference identified in levels of satisfaction. The female participants had a higher satisfaction rate compared to males ( $p=0.004$ ).

**Conclusion:** Our study results feed into India's national policy of promoting technology by showing that elderly individuals were positive about embracing newer communication tools. However, more research is needed in this area for an in-depth understanding.

**Key words:** Communication Technology, Education Technology, Indian Elderly, International Classification of Functioning (ICF)

## BACKGROUND

INCREASE in life expectancy and declining birth rate has contributed to the rise in the population of elderly [1]. Between year 2000 and 2050, the population over sixty five years will double, from 8% to 16% [2] and more than 1 person in every 10 will be aged 60 or older by the year 2050 [1]. However, the pace of the ageing population is much faster in developing countries compared to developed countries, especially in countries like India. According to United Nations Population Division report 2011, between the year 2010 to 2050, India's population which is 65 years and older, is expected to increase from 5 percent to 14 and the population eighty years and older will be tripled from 1 to 3 percent which is higher than the developed nations [1]. The growing population demands increased resources for elderly in the resource limited settings.

Personal expenses for medical care, inadequate geriatric health services and expensive private health sector in India reduces health service utilisation by elderly [3]. Current data on health status show rapid increase in cardiovascular, psychological illnesses and cancer among elderly

population in India [4]. In the population over 70 years of age, more than 50% suffer from one or more chronic diseases [5,6]. The survey results conducted in the southern part of India demonstrate that nearly two third of the rural elderly population did not utilize eye care services despite having large burden of eye diseases [7]. These results are supported by the study conducted by Agrawal et al [4]. Their findings demonstrate that almost half of the elderly participants did not take treatment and the reason was a significant proportion of undiagnosed diseases and disability [4]. A possible reason behind this is elderly's poor economic condition, limited access to health services [8] and their dependence on the family members for finance [9].

The current scenario in India requires alternate ways to deal with the increasing demand for long term elderly care. This can be possible through healthy lifestyle to reduce disease burden. There is supportive evidence in the literature, showing elderly with active life have reduced morbidity and mortality rate [10]. To encourage elderly living an active life, World Health Organisation introduced a concept called 'active ageing' in the year 2001; many countries adopted this concept and promoted an active lifestyle to the elderly, to give them an independent life in their home.

The second most populous country in the world, India is significantly behind in healthcare services for the elderly, due to shortage of workforce and healthcare centers; at individual level due to poverty and lack of awareness [11].

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There is a considerable gap between demand and supply of geriatric services, due to a shortage of trained health workers and health care facilities. This gap can be addressed through the use of technology effectively. Hence recent assistive technology tools for independent living have received considerable attention from the commercial developers and researchers in India.

The term 'Assistive technology' incorporates a wide range of devices, for example, telephone, handrails, wheelchair and smart home monitoring system. This technology helps elderly in their routine work, provides safety and reduces the need for informal caregivers [12]. In spite of having all these benefits, an assistive technology is less popular among the elderly population because of their negative perceptions [13].

End user's attitude towards the technology is crucial factor for any technology adoption. Technology perceived negatively by the users is more likely to be rejected, so it is very important to understand their attitude before introducing the technology [14]. There is a growing body of research directed towards the attitude of elderly towards the technology and most of these researches have been conducted in developed countries. There is a dearth of literature to understand the attitude of an elderly towards information and communication technology in developing countries, like India.

**Aim of the study:** To understand the attitude of elderly towards communication and education technology in semi-urban setting, in Delhi, India.

**METHODOLOGY**

This study was led by Dharma foundation, a non-government organisation in New Delhi. This organisation is actively promoting the concept of 'Active ageing' for elderly. A cross sectional survey was performed by selecting participants from two locations, namely Gurgaon and New Delhi. A cognitive function was measured by using a Hindi Mini Mental Examination (HMSE) developed by Ganguli et al 1995 [15], and the participants without cognitive impairment or with mild cognitive impairment were selected for this study. Thereafter, a written informed consent was obtained from all study participants, except when it was obtained from a family member by proxy in cases where the participant was unable to provide written consent by themselves. The study was conducted between the months of January 2012 and December 2012. This study was approved by the Ethics and scientific committee of Max Devki Devi Foundation, New Delhi, India.

To understand the attitude of elderly towards communication and education technology, we conducted the survey using the international classification of functioning, disability and health (ICF) ([16, 17]. A survey

questionnaire was designed on the basis of ICF and it comprised of questions based on demographics and attitude of elderly towards the communication and education technology, such as, mobile phone, television and computer. The survey responses were measured at -4 to +4 negative and positive scale.

Detailed explanation is given in table 1.

Barrier				Neither barrier nor facilitator	Facilitator			
-4	-3	-2	-1		1	2	3	4
complete	sever	moderate	mild	0	mild	moderate	sever	complete

*In this table, the Facilitator denotes positive attitude of elderly people's towards the technology and Barrier denotes the negative attitude of elderly towards the technology.*

**ICF framework:**

ICF is a framework for organizing and documenting information on functioning and disability at both individual and population level (WHO 2001). ICF has four components: a) Body functions and structures, b) Activities and participation, c) Environmental factors and d) Personal factors. The environmental factor in ICF reflects an important aspects of the physical, social and attitudinal environment in which an individual lives, which includes, products and technology; natural environment and human-made changes in the environment; support and relationships; attitudes and services, systems and policies.

The study of the impact of the environment is not limited in its relevance to disability. ICF environmental factors covers list of external influencing factors such as physical, social and attitudinal world in which people live and it can be used for other factors than disability assessment, such as, in capturing complex aspects of people's attitude [18].

To understand a holistic perspective of elderly towards education and communication technology, we selected two categories listed under products and technology (First is, Product and Technology for Communication (e125), which includes equipment, products and technologies used by people for sending and receiving information like telephone, mobile phone etc. and Second category was Product and Technology for Education (e130) defined as equipment, products and technology used for acquisition of knowledge like television, radio, computers etc.

**DATA ANALYSIS**

A descriptive statistical analysis (mean, frequency, standard deviation and percentage) was performed to examine the distribution of each variable. Chi-square tests were applied to analyse the differences in attitude on the

basis of gender and age. The level of significance was set at 0.05. All data were entered into an excel sheet and data were analysed with IBM SPSS 21.0.

## RESULTS

A total of 360 participants were screened and 335 participants were selected after HMSE test. We received 300 responses (149- Male, 151- Female), out of 335 surveys with an overall response rate of 89.5% (49% male and 51% female). The drop out includes 16 females and 19 males. Indicated reasons for drop out were: 2 participants died, 11 moved into a different place, 13 refused by family members, 4 withdrew at the time of assessment and 2 were not in good health.

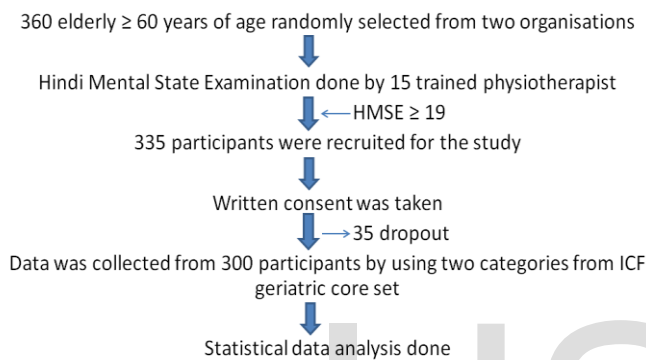


Figure 1: Flow diagram for participant recruitment

The study participants' age ranged from 60 to 92 years (with a mean age of 69 years) and 49.6% were males. The demographics are summarised in Table 2, below.

Characteristic	N=300DDN=300	P Percentage
<b>Sex</b>		
Male	149	49.6
Female	151	50.3
<b>Age groups</b>		
60-69	179	59.7
70-79	90	30
80-89	29	9.7
90-100	2	0.6

Table 2: Demographic characteristics of study

Overall 240 (80%) respondents expressed positive attitude in using both the education and communication technology. Eighty five percent elderly expressed positive attitude towards communication technology and 251 (83%) of respondents were positive in using education technology. Out of all respondents, 98 (32.7%) were highly satisfied with both communication and education technology. Only 2.3% respondents expressed negative attitude towards both communication and education technology. 18% were neutral on our scale. There was no major difference identified in levels of satisfaction with

individual technology (85% participants were satisfied with communication and 83.6% were satisfied with education technology).

Further responses are summarised in Table 3.

	Grades	Communication Technology		Education Technology	
		N (%)	95% CI	N (%)	95% CI
Facilitator (Satisfied)	1	87 (29)	23.87-34.13	84 (28)	22.92-33.08
	2	24 (8)	4.93-11.07	20 (6.6)	3.79-9.41
	3	31 (10.3)	6.86-13.74	30 (10)	6.61-13.39
	4	113 (37.6)	32.12-43.08	117 (39)	33.48-44.52
None	0	34 (11)	7.46-14.54	42 (14)	10.07-17.93
Barrier (Dissatisfied)	-1	5 (1.7)	0.24-3.16	5 (1.7)	0.18-3.02
	-2	5 (1.7)	0.24-3.16	2 (0.7)	-
	-3	-	-	-	-
	-4	1 (0.3)	-	-	-

Table 3: Frequency distribution of survey findings

Gender difference: In our study, we identified 86.5% males were satisfied with both communication and education technologies compared with 80.6% females. However, there was a significant difference identified in levels of satisfaction. The data given in table 4 demonstrate that females had a higher satisfaction rate compared to males (p=0.004).

Level of satisfaction	Male (%) (n=149)	Female (%) (n=151)	Total (%) (N=300)	P value
Highly satisfied (Scale 4)	37 (25)	61 (40)	98 (32)	0.004
Satisfied*	112 (75)	90 (59)	202 (67)	

Table 4: Comparative analysis between gender and level of satisfaction in both communication and education technology

(\* This includes level of satisfaction measured on scale 1, 2 and 3 in both technologies)

Age: Our results illustrate that the level of satisfaction increased with the age (see table 5). 87% respondents aged 80 years and above were more satisfied compared with 79% aged below 80 years, with both communication and education technologies. However, this difference was not statistically significant as p-value was 0.35.

Satisfaction	Age group 60-79 (%) (n=269)	Age group 80 years and above (%) (n=31)	Total (%) (N=300)	P value
Satisfied	213 (79)	27 (87)	240 (80)	0.35
Neutral or not satisfied	56 (20.8)	4 (12.9)	60 (20)	

Table 5: Comparative analysis between age and attitude in both communication and education technology

## DISCUSSION

The elderly have a greater propensity towards ill health compared to the general population. The 2004 National Sample Survey in India reported that nearly one fourth elderly reported poor health [19]. The data on population statistic show that in developing countries, close to 50% elderly death occurred due to the infectious diseases [20]. However, a sharp increase in the prevalence of non-communicable diseases has been seen in the last five years [21,22,23]. This situation is aggravated by the limited access to the health care facilities and shortage of workforce [24]. These barriers resulted because of significant under-utilisation of health care facilities by elderly. [11].

Healthcare policy makers are encouraging health care providers to make more and more use of information technology applications to fill this gap. Promoting the use of technology for elderly care in India is timely, but has raised questions regarding adoption of technology by elderly. For elderly in developing countries like India cost, computer anxiety and design of technology were identified as major barrier in adoption of technology [25].

To overcome these barriers, the developers of technology need to design a product which is cheaper and easy to use. It is a common assumption that elderly are not engaged with technology. However, research demonstrates that elderly were willing to use technology if they are in need of it and after training are able to use complex technology [14]. It is a fact that an effective implementation of technology depends on end user's attitude towards technology [26] and elderly are less likely to adopt new tools if they are deemed unfit [27].

As per our knowledge, our study is the first to highlight the attitude of elderly towards technology in India. The findings of our study demonstrate that the elderly have positive attitude towards communication and education technology. To our surprise, the participants aged 80 or above in our study were more positive towards the technology compared with the participants below age 80. Since the sample size of the age group 80 or above is small (31 participants), it is difficult to generalise these findings and it requires further study.

According to behavioural science research there is difference in attitude towards technology on the basis of the gender [28]. As per our knowledge, there are very few studies identifying the adoption on the basis of gender, in Indian context. In our selected participants, the elderly female respondents has a fifteen percent higher level of satisfaction with both communication and education technology, as compared to male participants. This result is

contributed by the fact that all our participants were from New Delhi, the capital of India and hence the exposure of communication and education technology application such as television and mobile phones was much higher, compared to other parts of India and that may have helped elderly females to have more positive attitude towards technology.

The studies conducted to identify gender differences in technology acceptance in other settings, show that gender disparity in using technology depends on the level of education, socioeconomic condition and male and female cultural differences [29,30]. Further research is required to identify effects of above mentioned variables in Indian context.

There were several limitations in our study. Elderly attitude was measured using ICF parameters with limited demographic details. Our study was performed in semi-urban areas in New Delhi with a higher percentage of literacy and technology uptake; therefore our results have limited generalisability to other locations.

## CONCLUSION

There has been an increased interest in promoting technology among elderly in India. The Government of India has recently introduced a Technology Interventions for Elderly which aims to promote active and healthy life for elderly in India. Our study results feed into the national policy of promoting technology by showing that elderly individuals in our setting were positive about embracing newer tools. However, more research is needed in this area for an in-depth understanding.

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