Digital Adoption Amongst the Elderly People in Odisha

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Abstract

The digital technologies have become integral part of peoples' daily lives in numerous ways, in their communication, health care management, shopping, financial transactions, and leisure activities. However, some of the previous studies observe that the benefits and access of digital spaces are not distributed equitably. Especially the older generation tend to use less digital technologies in comparison to younger generations, GenZ and millennials, thus giving rise to a digital division amongst the population. This paper tries to study the digital engagement of elderly people in Khurda district in Odisha with a specific interest on observing how the people adopt and use technology in their everyday life. In this study, a mixed-method methodology was used that incorporated the use of structured questionnaires and focus group discussions. The sample population was obtained as 292 respondents aged 60 and above drawn in Khurda district, Odisha. The rural, urban, and urban slum communities are found in the district and the state capital, Bhubaneswar, provides powerful digital infrastructure. The focus group discussion has been carried out with some people from these three groups belonging to different socio-economic back ground, who can give a better insight of the phenomena. To determine the impact of five independent variables age, gender, education level, location and income on digital technology adoption in three areas, which are entertainment, financial transactions and online shopping, three binary logistic regression models were used. The research underlines that income, education, locality, and gender are the factors that influence digital adoption among elderly people.

Keywords: digital technology, digital adoption, elderly people, digital divide

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1. Introduction

Digital inclusion is the new reality in the contemporary society. Technology has emerged as a transformative force in every field, be it social or economic domain. The digital transformation is universal; it has a huge potential to engage with people to perform their tasks and accomplish their work at their own pace (Charness et al. 2010). The digital technologies have touched peoples' daily lives in multiple ways, in their communication, health care management, financial transactions, leisure activities and shopping. The idea of digital dividend (Brink, 2001) highlights the socio-economic advantages of internet use particularly to the disadvantaged population. The Social Exclusion Unit (2005), and Olphert et al, (2005) emphasizes that the digital platforms are key entry points to digital information and services to socially excluded groups.

However, Mason & Hacker, 2003 in their study found that the benefits and access of digital spaces are not evenly distributed. Certain segment of the society, especially the older generation find less use of digital technologies, thus giving rise to a digital divide amongst the population. Studies carried out in UK, showed an increasing number of aged population disengaged in the use of internet (Mason and Hacker, 2003) and are at risk of being socially excluded (Olphert et al., 2005).

Government efforts in the India have enhanced a faster digital adoption in all sectors and in every sphere of our life. Although the GenZ and millennials has shown an immediate acceptance of digital tools and their usage in their daily lives, the older generation experiencing significant hindrances in adoption. The gap is especially visible in states like Odisha, where work on digital inclusion are in progress. The paper tries to study the digital engagement of elderly people in Khurda district in Odisha with a specific interest on observing how the people adopt and use technology in their everyday life.

The basic objectives of this study are threefold:

1. To investigate the level of adoption of digital technology by the elderly people in their day-to-day activities.
2. To identify the application of the digital tool in different areas of life among elderly people.

3. To determine the usage patterns based on the demographic variables like age, gender, education, location and income.

2. Literature Review

Current studies indicate the increasing presence of digital technologies in the life of older adults, which suggests their becoming more and more topical in the communication, health, financial, and social spheres of life. According to Gallistl et al. (2020), gadgets like mobile phones, tablets, and computers have become necessities even to the elderly population. Although such technologies are massively available, there are still disparities in digital activity across age. Lythreatis et al. (2022) distinguish three main types of factors that make older people digitally excluded: individual factors such as cognitive limitations and lack of confidence, societal factors such as isolation and limited peer support as well as environmental factors such as poor infrastructure and access to training.

The digital divide refers to disparities in access to and use of information and communication technologies (ICTs) across socioeconomic groups (OECD, 2001). As observed by Kumar (2004), the low internet adoption by the elderly is still a universal issue and most nations are still dealing with the first-level digital divide which is basic accessibility. The second-level gap, the meaningful and assured interaction with digital technology, still poses a challenge to the elderly population.

The concept of a demographic digital divide was introduced by Bucy (2000) who noticed that the internet users of the elderly are mostly white, well-educated and with a stable finances (Eastman and Iyer, 2004). Pew Internet (2004) however, established that other older generations who share quite similar characteristics have also demonstrated to be active online. The role of cognitive age in digital behavior is significant- older people who feel younger in terms of cognitive ability will tend to use and adopt digital services (Eastman and Iyer, 2005).

One of the major factors in the adoption of technology is age. Seniors are more apt to embrace the digital tools, since they are more educated, social, and financially independent (Sperazza et al., 2012). Conversely, people over 75 years tend to be more affected by cognitive and physical disabilities that prevent their inclination to use technology (Klimova et al., 2017).

The education has an effect on digital experience also. Research has indicated that older people who obtained higher education levels have much higher chances of applying and adopting digital technologies (Ma et al., 2016). As more people can become digitally literate, as Jin (2017) notes, the world of financial inclusion is directly connected to digital access, which strengthens the role of digital literacy in fostering economic participation.

On a contrary, older people are not non-users of technology but instead, their consumption habits vary with younger generations (Pew Internet and American Life Project, 2003). Steel et al. (2009) insist on customized training interventions that assist the elderly to learn and embrace digital tools. The advantages of the digital engagement are lower costs of traveling, better communication, reduction of the caregiver burden, and increased independence and safety (Beer and Takayama, 2011; Macedo et al., 2017; Yusif et al., 2016). However, obstacles to this are still there. The elderly are frequently faced with individual, cognitive, and physical issues that restrict their online engagement (Yusif et al., 2016).

3. Methodology

In this study, a mixed-method methodology was used that incorporated the use of structured questionnaires and focus group discussions. The sample population was obtained as 292 respondents aged 60 and above drawn in Khurda district, Odisha. The rural, urban, and urban slum communities are found in the district and the state capital, Bhubaneswar, provides powerful digital infrastructure. The focus group discussion has been carried out with some people from these three groups belonging to different soci0-economic back ground, who can give a better insight of the phenomena.

To determine the impact of five independent variables age, gender, education level, location and income on digital technology adoption in three areas, which are entertainment, financial transactions and online shopping, three binary logistic regression models were used.

The sample consisted of 292 old people:

- **Age brackets** Two groups; 60-70 years and 70 above. Gender: 104 female and 188 male respondents.
- **Location**: 176 rural, 94 urban and 22 urban slum residents.

- **Education**: 192 had education until matriculation, 15 had intermediate degrees and 85 were graduates or higher.
- **Income**:
  - 116 had annual income below ₹50,000 or no stable income.
  - 20 earned between ₹50,000 and ₹2,00,000.
  - 45 earned between ₹2,00,000 and ₹5,00,000.
  - 111 earned above ₹5,00,000—mostly retired government or bank employees.

This population heterogeneity made it possible to provide a subtle evaluation of digital adoption trends in socio-economic classes.

4. Analysis of Data

4.1. Descriptive Statistics

The demographic and behavioral patterns of 292 elderly residents in the Khurda district, Odisha is shown in Table 1.

Table 1: Results of Descriptive Statistics

Factors	Frequency	Percentage
Age:		
60-70	105	36
70 and above	187	64
Gender:		
Female	104	35.6
Male	188	64.4
Location		
Rural	176	60.3
Urban	94	32.2
Urban Slum	22	7.5
Education:		
Upto Matriculation	192	65.8
Intermediate	15	5.1
Graduation and above	85	29.1
Personal Income:		

Less than ₹50,000	116	39.7
50,000-2,00,000	20	6.8
2,00,000-5,00000	45	15.4
5,00,000-above	111	38.0
For Entertainment Usage:		
No(0)	104	35.6
Yes(1)	188	64.4
Financial usage of digital technology:		
No(0)	207	70.9
Yes(1)	85	29.1
Online Shopping:		
No(0)	245	83.9
Yes(1)	47	16.1

4.2. Model Diagnostics

To assess the goodness of fit for the logistic regression models, the Hosmer and Lemeshow test was applied. Table 2 gives statistics of all three models having p-values greater than 0.05, indicating that the models fit the data well.

Table 2: Goodness of Fit(Model Diagnostic): Hosmer and Lemeshow Test

Model	**Digital Technology used For**	**Step**	**Chi-square**	**df**	**Sig.**
1	Entertainment	1	6.032	8	0.644
2	Financial usage	1	5.024	8	0.755
3	Online shopping	1	2.756	7	0.907

4.3 Binary Logistic Regression Analysis

4.3.1 Model 1: Entertainment Usage Regression findings in Table 3 show that income, age, gender, location, and education are significant factors that determine the use of digital technology to entertain among the older people. The income bracket exceeding rupees 5,00,000/year is 2.30 times more likely to use entertainment digital tools than persons with a low income of less than 50,000 ($p = 0.014$). The role of age is also critical with those who are

aged between 60 and 70 years being 4.21 times more prone to participate in digital entertainment as compared to those who are 71 and above years old ($p < 0.001$). There are some gender variations with males being 2.33 times as likely to use digital tools of entertainment compared to the females ($p = 0.015$). The location is slightly important, so urban citizens were more likely to use marijuana than the people living in the countryside ($p = 0.052$). Education is as well a powerful predictor; graduates and people with a higher education level are 9.49 times more likely to use digital entertainment tools compared to people with matriculation or below ($p = 0.057$).

Table 3: Binary Logistic Regression Model For Entertainment

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Personal income			6.145	3	.105	
	Personal income(1)	.529	.648	.667	1	.414	1.698
	Personal income(2)	.486	1.579	.095	1	.758	1.626
	Personal income(3)	.834	.340	6.031	1	.014	2.303
	Age(1)	1.438	.339	18.047	1	.000	4.213
	Gender(1)	.847	.349	5.901	1	.015	2.333
	Location			4.054	2	.132	
	Location(1)	2.147	1.104	3.784	1	.052	8.561
	Location(2)	.297	.526	.320	1	.572	1.346
	Education			4.503	2	.105	
	Education(1)	.683	.648	1.113	1	.292	1.981
	Education(2)	2.250	1.184	3.612	1	.057	9.489
	Constant	-1.774	.400	19.681	1	.000	.170

a. Variable(s) entered on step 1: Personal income, Age, Gender, Location, Education

4.3.2 Model 2: Financial Usage Table 4 indicates that income, age, location, and education are important predictors of digital financial engagement. Those with monthly incomes between 50,000- 2,00,000 are 7.25 times more likely to use digital platforms to conduct financial transactions than earners with monthly incomes less than 50,000 ($p = 0.019$). The aspect of age also remains relevant, and respondents between 60 and 70 years are likely to have participated in digital financial activities 3.87 times more than respondents with an age of 71 and above (p

= 0.024). City life is an important condition that predisposes to the use of digital financial means, and urban residents are 7.73 times more likely to use this type of tool than rural residents (p = 0.026). The most powerful variable to this model is education, graduates and above are 24.14 times more likely to participate in digital financial activities compared to those with lower educational levels (p < 0.001).

Table 4: Binary Logistic Regression Model for Financial usage

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Personal income			8.195	3	.042	
	Personal income(1)	1.981	.841	5.546	1	.019	7.252
	Personal income(2)	.095	1.134	.007	1	.933	1.100
	Personal income(3)	-.219	.975	.050	1	.822	.803
	Age(1)	1.353	.598	5.119	1	.024	3.870
	Gender(1)	1.222	.756	2.615	1	.106	3.393
	Location			5.383	2	.068	
	Location(1)	2.045	.920	4.938	1	.026	7.731
	Location(2)	.950	.908	1.095	1	.295	2.586
	Education			18.853	2	.000	
	Education(1)	.135	1.077	.016	1	.900	1.145
	Education(2)	3.184	.759	17.579	1	.000	24.140
	Constant	-5.422	.947	32.805	1	.000	.004

a. Variable(s) entered on step 1: Personal income, Age, Gender, Location, Education

4.3.3 Model 3: Online Shopping Table 5 indicates that other factors that influence the online shopping nature of the elderly greatly include the income, age, location and education. The income brackets of 50,000 to 2,00,000 have a 7.62 times higher likelihood of shopping online than the income bracket lower than 50,000 (p = 0.041). Age is a strong predictor of digital engagement with the respondents aged 60 to 70 being 7.15 times more likely to do online shopping compared to the respondents at the age of 71 and above (p = 0.005). Life in an urban area predisposes people to online shopping by 7.28 times compared to living in the rural environment (p = 0.020). Education levels remain an important parameter with the level of 5 or higher being 5.01 higher than those having matriculation education (p = 0.047).

Table 5: Binary Logistic Regression Model: Online shopping

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Personal income			7.840	3	.049	
	Personal income(1)	2.030	.995	4.164	1	.041	7.618
	Personal income(2)	-.146	1.114	.017	1	.896	.865
	Personal income(3)	.139	1.032	.018	1	.893	1.150
	Age(1)	1.967	.696	7.991	1	.005	7.149
	Gender(1)	.117	.672	.030	1	.862	1.124
	Location			5.389	2	.068	
	Location(1)	1.985	.855	5.389	1	.020	7.282
	Location(2)	-17.76	7934.03	.000	1	.998	.000
	Education			3.973	2	.137	
	Education(1)	1.043	1.165	.803	1	.370	2.839
	Education(2)	1.611	.810	3.952	1	.047	5.008
	Constant	-5.572	.996	31.311	1	.000	.004

a. Variable(s) entered on step 1: Personal income, Age, Gender, Location, Education

5. Discussion

5.1 Age, and Educational Effects

This research indicates that there are huge differences in the adoption of digital technology among older people in Odisha and these are influenced by their demographic and socioeconomic background. The age factor was found to be a constant reason in all three areas, which include entertainment, financial transactions and online shopping. The seniors (60–70) showed a greater level of engagement than the seniors (71 and above), which suggests that the younger ones among the seniors are more accommodative to digital technologies.

The other influencing factor in the adoption of digital technology among the old was education. More importantly, graduates and persons with higher education levels were much more likely to utilize digital tools in all the areas entertainment, financial transactions, and online shopping. Conversations with focus groups showed that well-educated older participants were more confident in their digital interface navigation and more knowledgeable on cybersecurity issues,

and expressed willingness to try-out new applications, especially with the help of family members or community-based workshops, whereas, the less educated individuals tended to say that they felt anxious when using smart phones or internet facilities because of the fear of making errors or victimised by the cyber fraudsters.

5.2 Socio economic and demographic influences

The income was also a critical factor in determining the digital engagement patterns among the elderly cohort. There was a greater inclination toward financial transactions and online shopping using digital channels among the individuals with incomes between 50,000 and 200,000 every year, presumably because those categories of people remain active in the economic sphere: they can run a small business or hold a part-time job. Conversely, individuals whose annual incomes are above 5,00,000 were more active in the use of digital tools in the entertainment context but relatively less active in the financial dealings. The findings of focus groups indicated that the majority of people in this high income bracket were retired workers, more so in government services who had a concern about their safety and confidence in the internet financial systems. They were unwilling because they were afraid of cyber frauds and losing their large sums of savings as well as pension deposits. On the other hand, participants with lower income, as those who were economically active, considered digital financial tools as the key to their daily activities and business processes. The attitude to adopting digital modes as functional was also more liberal because they had less financial exposure. Such patterns are also consistent with the existing literature with barriers that include cognitive decline, training, and infrastructural limitations among older adults (Steel et al., 2009; Yusif et al., 2016).

5.3 Rural–Urban Disparities

There were also differences of location. The adoption rates of urban dwellers were better than their rural counterparts due to the improvement in infrastructure and exposure to digital services and the social support networks. The common challenges that the rural participants experienced as stressed in the focus group discussions included a lack of connectivity, failure to access training, deficiency of peer and family support. Most of them showed their interests in utilizing electronic tools but were limited by the infrastructure and lack of information. These results support the argument that specific digital literacy programs are necessary that must both take into account educational differences and geographic differences.

5.4 Gender effect

The difference in genders was not as high but still significant especially in the field of financial usage where the males were more involved. These trends conform to the literature that outline obstacles that include cognitive impairment, the absence of training, and infrastructural constraints among elderly people (Steel et al., 2009; Yusif et al., 2016). These trends were further clarified by insights offered by discussions by focus groups. Male respondents, particularly those who had been exposed to banking or administration were more confident about using digital financial systems and more likely to try online transactions. Conversely, a large number of the female respondents, especially the rural ones, claimed to have little independence to financial decision-making, and were not comfortable with the digital interface. A number of women also reported that they normally ask for help from family members who are typically younger men to make on-line payments or do any banking transactions on their behalf. However, the interviews also revealed an increasing interest of elderly women, particularly in urban areas, in gaining knowledge of digital products in community classes and peer support. This indicates towards a changing trend in which the gendered barriers can become less pronounced over time with specific digital literacy and training multi-racial training. Comprehensively, the presented results indicate the complexity of the issue of digital inclusion, the boundaries of which are demographic, socioeconomic, and psychological aspects.

6. Conclusion & Recommendation

The research underlines that income, education, locality, and gender are the factors that influence digital adoption among elderly people. The moderate-income earners who are still economically active are more likely to use digital platforms for their financial and transaction purposes. Conversely, more affluent retirees, particularly those with a government service background, are more inclined to use digital media to entertain themselves and are hesitant to use the internet in their financial dealings. The level of education is a major factor in increasing a digital confidence and literacy level that allows the widening of the fields of interest. City dwellers are better served with improved infrastructure and support networks whereas rural players are constrained with connectivity and training problems. Gender disparities, which are not so vivid, indicate that men are more active in the use of finance, whereas women tend to be dependent and show interest in the organized learning environment.

The digital divide is not a technical issue, but a social necessity that will enhance the life and independence of the older generation. Such results are in line with the previous studies that found cognitive deterioration, inadequate training opportunities, and infrastructural disparities as significant barriers to digital inclusion among the aged (Steel et al., 2009; Yusif et al., 2016). The lessons gained based on the focus group discussions support the necessity of the specific interventions that are comprehensive and cover both psychological issues and systemic restrictions.

6.1 Recommendations

6.1.1 Government intervention

Government has taken many steps to promote digital penetration in India, however a focussed digital literacy drive in rural areas by government agencies will help to accelerate the pace of digitalisation among the mass. A hands-on experience with the support of community centers should be given to people on financial safety, mobile and online banking and access to public services. Elderly people getting pension or availing welfare schemes should be integrated with digital platform through trusted outreach channels to build their trust and enhance confidence in the digital system. At the same time, expanding internet infrastructure in underserved regions should be expanded to ensure reliable access and connectivity.

6.1.2 Non-government interventions

Financial institutions also play a very important role in easing the digital platforms to the elderly. Barriers can be minimized by designing user-friendly banking applications whose interfaces will be user-friendly, voice-assisted, and regional language-based. The digital divide can be reduced if face-to-face sessions in the bank branches and outreach programs can be conducted for the elderly. Moreover, the confidence can be built by providing senior citizen-specific helplines and fraud protection service, which will lead to higher adoption.

Such efforts can be supported by the community organizations and non-governmental organizations through peer-led workshops where digitally literate seniors can mentor their peers in the community. Mutual learning and mutual engagement can be achieved through co-operations with schools and colleges to develop intergenerational learning programs. Feedback

sessions should also be held to regularly to change the training content as per the needs and comfort of old participants.

A heterogeneous group of elderly people requires policymakers and stakeholders to acknowledge the differences and develop inclusive policies that would support the fair access to digital tools. The digital divide is not only a technological but also a social issue that can help to improve the quality of life and autonomy of older adults.

7. Limitations and Future Research Prospects

This study has some limitations even though it has contributed to the knowledge base related to digital acceptance and adoption among elderly people. This study was limited to Khurda district, Odisha, and this can limit the extension of the results to other areas with different socioeconomic and infrastructural settings. The sample population of 292 respondents (elderly) is enough to perform the analysis, but it might not be sufficient to represent the heterogeneous population of older people in the rural, urban, and slum areas. The cross-sectional one gives a picture of the pattern of digital adoption at a particular time but fails to show the changes with time. The faster changing digital environment and digitalisation is also forcing people to adapt to the changes. Moreover, the researchers concentrated on the three activities namely entertainment, financial and shopping activities leaving other sectors including healthcare, social communication, and government services unexplored. This work can be further developed in future studies that ought to cover different geographic areas, a larger and more diverse sample, and other spheres of digital interaction. Intervention-based research or longitudinal studies assessing the effectiveness of digital literacy programs and easy-to-use technologies may give more information about the ways to enhance the idea of digital inclusion among the older adults.

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