

Unmet Needs and Barriers to Assistive Technology in the Coastal Districts of Karnataka, India

Abstract

Background: Assistive Technologies (AT), such as hearing aids, walking aids, prostheses, spectacles, can improve the quality of life and enable many to lead dignified lives. The rapid Assistive Technology Assessment (rATA) tool developed by World Health Organization (WHO) can measure the needs of AT and the barriers to accessing them. **Objective:** This study aimed to measure the unmet needs and the usage of AT via the rATA tool in the coastal state of Karnataka in India. **Methodology:** A population-based survey was conducted among a total of 500 households - 250 from Mangalore and 250 from Udupi of Coastal Karnataka. The need for AT was assessed under six domains of activities, including mobility, seeing, hearing, communication, remembering, and self-care. **Result:** The mean age of study participants was 34.3 years with standard deviation of 21.2 years. 30.6% of the study participants reported the use of assistive products out of which 27.3% used one product and 2% used two products. 89.5% of assistive products were procured from private sector and only 4.1% was obtained from public sector. The level of difficulty in doing any activity increased with age. 301 participants reported out of pocket expenditure for assistive products with mean expenditure of Rs 2226.05 (S. D. 2204) per year. Spectacles, orthoses (spinal) and therapeutic footwear were most common assistive products with unmet need. **Conclusion:** Our findings highlight the urgent need to mainstream geriatric care policies which address functional difficulties among older people, resolve out-of-pocket spending through public private partnership for assistive technologies.

Keywords: Assistive technology, disability, ECIPH, rapid assistive technology assessment tool, social protection

Introduction

The rapid assistive technology assessment (rATA) tool was designed by the World Health Organization (WHO) in 2014 to map the need, demand, supply, and user satisfaction with assistive technology (AT) that could serve to inform and shape new policies that support social inclusion and social protection.^[1,2] AT is defined by the WHO as “the application of organized knowledge and skills related to assistive products (APs), including systems and services” (WHO, 2018).^[3] It is estimated that over two billion people will need at least one assistive product by 2030 and possibly older people needing more.^[4]

AT, such as hearing aids, walking aids, prostheses, and spectacles, improves the quality of life and enables many to lead dignified lives besides improving the quality of life. However, the absence of concrete data and no policy around the population need gap paralyzes the persuasion of

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mainstreaming APs for the public good. rATA is a population-based survey tool that is interview-driven to collect standardized data on AT and to ascertain the unmet needs and barriers to leveraging technology.^[1]

Responding to AT and engaging in AT-driven adaptation will serve to strengthen human care and human response, thus preparing us for future risks and risk-informed planning. This study was conducted to assess unmet needs, barriers, and challenges of AT at the community level and estimate self-reported functional difficulty, and measure the use of AP, accessibility, barriers, costs, associated with their use.

Subjects and Methods

Study design and sample

A population-based survey was conducted using the WHO rATA tool. The study was conducted using an app-based platform to record the data at household levels in real-time monitoring mode. Multistage household cluster sampling was used to

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identify the urban and rural population factoring in the Census Enumeration Block (CEB) as the primary sampling unit within local administrative units. Using population proportional to size, 13 CEBs were selected in each district. To select the households, CEB was divided into segments of equal population comprising 20 households each. From each selected segment, all 20 households were covered. A total of 500 households were considered where 250 urban households and 250 rural households were covered and administered the rATA survey tool. The survey was conducted in the local language of Kannada and was back-translated when technicalities were involved. The anonymity of the study participants was maintained, and confidentiality was ensured.

Study setting

The study was conducted in the region of Dakshina Kannada District and Udupi District. In Dakshina Kannada, Mangaluru, urban was the participating population, and in Udupi District, Udupi, rural was the participating population.

Ethical approval and consent

Ethical approval was taken from the Institutional Ethics Committee (Ref no: 632/September 03, 2021). Participants were explained the objective of the study and a detailed participant information sheet was provided to them. Participation was voluntary, and verbal informed consent was obtained from the participants. This was executed under information to the District Health Office of Dakshina Kannada and Udupi Districts of Karnataka State in India.

Study tool

The WHO rATA tool questionnaire is designed to assess the need, demand, supply, and user satisfaction with AT. It is a population-based approach designed by the Global Cooperation on Assistive Technology, a unit of the WHO. The tool consists of questions regarding demographic data, including the age and sex of an individual, and the needs of an individual to indicate the difficulties in performing certain activities due to health impairment. The need for AT was assessed under six domains of activities, including mobility, seeing, hearing, communication, remembering, and self-care. It also includes questions regarding the demand and supply of the products they use, product list, sources of the products,

payers of the product, distance to travel for the products, unmet needs, and satisfaction about the product they use. The unmet need was considered if the answer to question “Do you think you need any AP(s) that you do not currently use, or you currently use but need to be replaced?” was yes.^[2]

Statistical analysis

Data were analyzed using the Statistical Package for the Social Sciences for Windows, version 26 IBM Corporation (Armonk, NY, USA: IBM Corp.). Descriptive statistics was summarized in percentages and proportions, and feedback on comments has been recorded as empirical evidence.

Results

The study included 998 participants from Karnataka between age 0 to 87 years. The mean age of study participants was 34.31 (standard deviation [SD] –21.21) years. Some difficulty (but not higher levels) was reported for any domain among 32.87% of the study participants, while the higher level of difficulty (a lot or cannot do without AT) was reported for any domain by 5.31% of the study participants. It increased with age and was similar in both genders, with slightly higher prevalence among females. Almost one-third of participants experienced difficulty in seeing and more than one-tenth experienced difficulty in mobility [Table 1].

Use of assistive products

30.6% of the study participants reported the use of APs and 27.3% used at least one product to perform difficult activities [Table 2]. The products used by participants for different activities are given in Figure 1. The most commonly used products were spectacles (low-vision, short/long distance/filters, etc.), orthoses (spinal), and chairs (for shower/bath/toilet).

Source of product

Most of the APs were procured from the private sector (89.53%), which included private facilities, hospitals, clinics, shops, and stores and only 4.1% were obtained from the public sector, that is, government facilities or public hospitals while the rest were obtained through NGO sector, friends, family, and self-made.

66.6% of the payments for products were made out of pocket by the users and 27% of payments were made by

Table 1: Severity of difficulties experienced by sample population and use of assistive products (n=998)

Level of difficulty	Some difficulty, n (%)	A lot of difficulty, n (%)	Cannot do at all, n (%)	Use assistive products, n (%)
Mobility	113 (11.3)	18 (1.8)	6 (0.6)	35 (3.5)
Seeing	297 (29.8)	28 (2.8)	5 (0.5)	292 (29.2)
Hearing	21 (2.1)	3 (0.3)	1 (0.1)	0
Communication*	8 (0.9)	1 (0.1)	2 (0.2)	1 (0.1)
Remembering	22 (2.4)	1 (0.1)	2 (0.2)	2 (0.2)
Self-care	14 (1.5)	3 (0.3)	3 (0.3)	15 (1.5)
Need assistive technologies	328 (32.9)	47 (4.7)	11 (1.1)	305 (30.6)

*Communication, remembering, and self-care were for age 5 or above

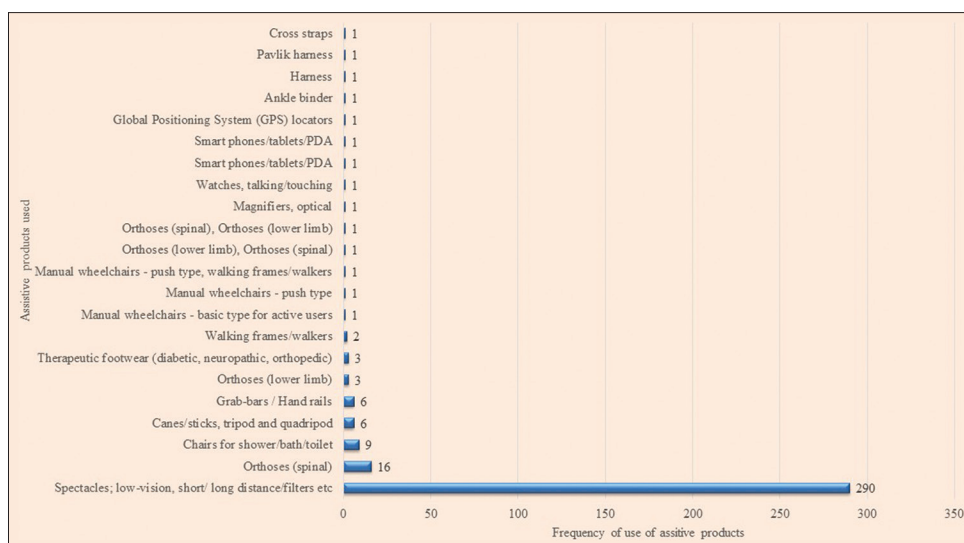


Figure 1: Frequency of using assistive products in the study sample

family and friends, while only 3.2% of payments were made by the government and 0.87% by NGO or charity. 301 of the total participants reported out-of-pocket expenditures with a mean expenditure of Rs. 2226.05 with the SD of Rs. 2204 a year for the AP.

The study participants reported traveling <5 km to get 47.1% of APs. Among the study participants, 77 (7.7%) answered affirmatively for the need for any AP they do not currently use or currently used but needs to be replaced (unmet need). Three most common products with unmet needs were spectacles (41), orthoses-spinal (14), and therapeutic footwear (4).

When asked about how satisfied the participants were with the product they use, 56.1% reported very satisfied, and 38.1% quite satisfied.

Spectacle use among participants

The majority of spectacle users were among the age of 18–60 years (67.2%), followed by 61 years and above (28.6%). Out of 290 spectacle users in the study, 57.6% were females. The most common source for spectacles was the private sector (94.1%) and 68.3% of users reported paying out of pocket for spectacles and for 28.6% of users, the cost was paid by family or friends. The mean expenditure on spectacles was found to be Rs. 2272.09 with an SD of Rs. 2214.83 among 287 participants with reported expenditure for spectacles.

Discussion

The study was conducted in Karnataka state in India to assess the use of AT using the WHO rATA tool. In the study, 32.8% of participants reported some difficulty and 5.3% reported higher difficulty in performing the activity in at least one domain due to health conditions. The result from the study has shown that the prevalence of difficulty

Table 2: Use of assistive products among study participants

Variable	Frequency (%)
Number of products used	
1	272 (27.3)
2	20 (2.0)
3	12 (1.2)
4	1 (0.1)
Source of product	
Public sector - government facility/public hospital	14 (4.07)
NGO sector - nonprofit facility	1 (0.29)
Private sector - private facility hospital/clinic/shop/store	308 (89.53)
Friends/family	5 (1.45)
Self-made	7 (2.03)
Other	8 (2.33)
Do not know	1 (0.29)
Payment of product	
Government	11 (3.20)
NGO/charity	3 (0.87)
Employer/school	1 (0.29)
Insurance	1 (0.29)
Paid out-of-pocket (self)	229 (66.57)
Family/friends	93 (27.03)
Self-made	6 (1.74)

in health domains increased with the age of the population and a slightly higher prevalence among females was observed. Similarly, Ebuenyi ID *et al.* in Malawi reported as the age of population increased, the higher proportions of study participants reported difficulties in performing activity.^[5] Another study from North India reported higher use of spectacles in age 30-49 compared to those above 50 years however it did not study the difficulty in other domains.^[6]

In our study, higher use of AT was also reported among the study population, with 30.6% of the study participants reporting the use of APs. Desideri L *et al.* in Italy reported higher (58.6%) levels of need and met need (51.7%) using rATA tool. Furthermore the unmet need of only 6.9% was found which is similar to our study where 7.7% of unmet need is reported.^[7] According to the Global Report on Assistive technology, the prevalence of need for assistive products was in range of 9.9% to 68.9% (median: 24.7%) which increased in countries with higher Human Development Index (HDI) scores and access to assistive products also increased in countries with higher HDI.^[8]

The most commonly used products reported in this study were spectacles (low-vision, short/long distance/filters, etc.), orthoses (spinal), and chairs (for shower/bath/toilet). That spectacles were the most commonly used AP is also reported in studies conducted by Boggs *et al.* in Guatemala and the scoping review in the resource-limiting setting conducted by Matter *et al.*^[9,10]

The study also reported on sources and payments for APs. It revealed most (89.53%) of the APs were procured from the private sector. Therefore, gap exists in public facilities for providing assistive products which is also reported by Borg and Östergren in their study in Bangladesh and Global Report on Assistive Technology.^[8,11]

Although the provision for free spectacles for elderly for near vision and school going children is included in the National Programme for Control of Blindness.^[12] Our study reported a gap in the procurement of spectacles from government facilities and the high out-of-pocket expenditure for procuring them. Almost 53% of the study participants also reported traveling more than 5 km to get APs and 7.7% reported unmet need for the AP, most common products which included the highest unmet need for spectacles (41), orthoses-spinal (14), and therapeutic footwear (4).

Conclusion

Investment in social policy protection and social inclusion for supporting AT will be needed by national governments moving forward. A national policy on AT at the heart of development can become a tool for governments to put people and their well-being first. An overarching goal of this social protection AT policy must ensure last-mile coverage to support vulnerable populations in terms of leveraging good governance, which bridges gaps across all socioeconomic strata, leaving no one behind. With the burden of aging increasing, dependency on AT will increase, which warrants

governments to step in before is too late. Keeping in mind future riskscape, AT-centered policies are important for governments around the world to pursue.

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Conflicts of interest

There are no conflicts of interest.

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