NEED ASSESSMENT OF ASSISTIVE TECHNOLOGY IN CHILDREN WITH MULTIPLE DISABILITIES

Saba Safdar, Shahzad Ali Khan*, Naila Azam, Humaira Mahmood, Farrah Pervaiz**

Armed Forces Post Graduate Medical Institute/National University of Medical Sciences (NUMS) Rawalpindi Pakistan, *Health Services Academy Islamabad Pakistan, **Armed Forces Institute of Cardiology/National University of Medical Sciences (NUMS) Rawalpindi Pakistan

ABSRTACT

Objective: To quantify the need for assistive technology in children with disabilities and determine the barriers for the use of assistive technology and formulate recommendations for the optimum use of assistive technology for children with disabilities.

Study Design: A descriptive cross sectional study design.

Place and Duration of Study: Study was carried out in National Institute of Rehabilitation Medicine, Islamabad from Apr 2018 to Sep 2018.

Material and Methods: A WHO structured questionnaire was used. It assessed the assistive technology needs in children with disabilities. Due to complexity of the questionnaire, it was explained to the respondents of the study. Sampling was done through non-probability convenient sampling. One hundred and thirty eight respondents were included in the study. SPSS was used for Statistical analysis of the data.

Results: Overall, the needs of children were highest for the mobility aids. Among which mostly need Lower limb orthosis (43.5%) and walking frame (37%). Various barriers were identified in access to assistive technology but the most common was lack of awareness (34.8%). It also showed highly significant association of age with walking, communication, remembering and performing day to day activities (p=0.000) and significant association of age with barriers (p=0.014) and health condition (p=0.001) and between employment status and barrier (p=0.002), while no association was seen among other variables.

Conclusion: To improve the health status of poor children living with disabilities, assessment of their basic needs for assistive technology is crucial so that they can be given equal rights as children without disabilities and the barriers which they are facing in the access to health care could be eliminated.

Keywords: Assistive technology, Children with disabilities, Needs assessment, Slums.

INTRODUCTION

Children with disabilities are the most stigmatized and excluded groups of children worldwide. The probability of having poorer health, less education and less economic opportunity is more in them than their peers without disabilities when they grow up[1]. According to an estimate there are 6.5 million children with disabilities in the U.S[2]. The prevalence of disability is higher in lower-income countries than higher-income countries[3]. One recent study that is screened for developmental disabilities in low- to middle-income countries quoted previous studies stating that the prevalence of developmental disability ranges from 0.4 to 12.7 percent[4]. Access to healthcare is a well-known problem in low- to middle-income countries. In developing countries the mortality rate of Children with disabilities is higher because of lack of basic healthcare[4]. Disabled people of developing countries have no equal and enough access to education, employment and medical care. Their physical or mental condition along with a shortage of financial and technological resources, imposes a burden on the family as well as the State[5].

In 2015, United Nations adopted sustainable development goals (SDGs) that put forward a new target for global health and the goal of SDG 3 is to "ensure healthy lives and promote well-being for all at all ages". It does so by focusing on

Correspondence: Dr Saba Safdar, Armed Forces Post Graduate Medical Institute Rawalpindi Pakistan
Email: saba123947@gmail.com

how assistive technologies can assist in improving the well-being of disabled people[6]. Assistive technology make people live healthy, productive and independent lives, participate in education, the labor market and social life[7].

More than a billion people need one or more assistive devices, with an estimated two billion in need by 2050[7]. As per World Health Organization (WHO) estimates only 5–15% of those who need assistive technology have access to it in low and middle-income countries[8]. Problems in improving access to assistive technologies in low- and middle-income countries arise from little production and limited quality, economic barriers and lack of government funding, supplies and human resources. Particularly at provincial and district levels, scarcity of trained personnel for the provision of assistive technologies is seen. In many settings where access could be possible, the costs are too high. Even in high resource settings, such as USA, access to these technologies and skilled providers is often limited and varies significantly across states and districts, in addition to urban and rural areas[9].

In Pakistan, 43.4% children have disability of the total disabled population, with 58.4% male and 41.6% female. It is expected that about 1.4 million (28.9% of the total number of PWDs) children of school going age have no access to education[10]. The major issue in Pakistan is that the needs of children with disabilities are not being catered efficiently. They lack proper medical, educational and recreational facilities and are accused of their disabilities but nothing has been done to support them in overcoming the hardships they face in leading a normal life. Lack of funding and resources in Pakistan is one of the reasons that several policies have been devised but the implementation is still awaited[11].

Moreover, assistive technology has been a missing link in the chain of prerequisites that support children with disabilities to have a life where they can exercise their rights[12]. Literature shows that global assistive technology need is not quantified so far and unmet need for assistive products is poorly studied which has constrained evidence-based policy and practice change[12]. Recognizing its importance, this study is conducted. The findings will provide an insight into planning programmes for health monitoring and promotion and medical services for children with disabilities who live in a similar context. The study aims to assess the needs of disabled children for assistive technology in developing country like Pakistan.

MATERIAL AND METHODS

The present cross sectional descriptive study was conducted in National Institute of Rehabilitation Medicine (NIRM) located in Islamabad. The study was carried over a period of 6 months (April 2018 till September 2018) in OPD of the NIRM by non-probability convenient sampling. Parents of children with disabilities visiting NIRM and fulfilling the eligibility criteria were enrolled in the study. Parents having disabled children responded to the questions on behalf of their child. A WHO structured questionnaire, Assistive Technology Assessment-Needs (ATA Needs), consisting of 75 questions was used after pre-testing on 15% of the sample. The content and consensus validity of the questionnaire was increased by extensive literature search and inviting suggestions by circulating it among experts of the field. A total of 138 participants were involved in the study. Prior consent for conducting of study was obtained from the participants after briefing them the objectives of the study. A descriptive statistical analysis was done by calculating means, standard deviation, frequency and percentages. The study was conducted after approval from the Ethical Review Board of AFPGMI. Participants were guaranteed confidentiality of the information and had the right to refuse participation or quit participation at any time during data collection of study.

RESULTS

Total 138 participants were sampled for the study. The socio-demographic characteristics of the study participants (table-I) showed that 74 (53.6%) were male and 64 (46.4%) were female.

The majority of the population 67 (48.6%) belonged to age group between 9 to 12 years of age. Almost two third of the parents or guardians were employed 103 (74.6%). The general socio-demographic characteristics of study subjects (table-II) showed that mean family size of participants was 6.58 ± 2.358; the mean years of schooling were 4.59 ± 1.717; mean daily earning was 458.57 ± 176.354 and mean monthly salary of the household was 17932.04 ± 6863.176. Out of total 138 participants included in the study it was observed that those who need walking devices among them majority 20 (43.5%) need Lower Limb Orthosis, those with visual aids need, mostly among them need spectacles 11 (44.0%), ones with hearing and communication devices need, most of them need speech therapy 16 (64.0%), those with the need for assistive devices to accomplish day-to-day tasks, majority 19 (95.0%) had the need for chair for shower, bath or toilet and those who require devices to manage the disease/health condition most of them 16 (76.2%) had the need for Lower limb orthosis (table-III). When barriers in AT access were determined, lack of awareness 48 (34.8%) was identified as a leading cause children with disabilities were not using desired products and ineffectiveness of the product was the least cause of non-use of the product. Further analysis revealed the association among different variables. Chi-square test was applied to determine the association. A chi-square test for independence indicated no significant association between gender and difficulty in walking, seeing, hearing, communicating, remembering, performing day-to-day activities, health condition for which assistive product is required and AT abandonment and barriers, (p>0.05) while a highly significant association between age and difficulty in walking, communicating, remembering and performing day-to-day activities, (p=0.000) and between age and health condition for which assistive product is needed and barriers in AT access (p=0.001 and p=0.014 respectively) was found. A chi-square test for independence also indicated significant association between employment status and barriers in access to AT, (p=0.002) and no significant association between monthly salary of the parent and the AT usage, abandonment and barriers, (p>0.05).

Table-I: Demographic characteristics of subjects.

Gender	**Frequency (Percentage)**
Male	74 (53.6%)
Female	64 (46.4%)
Age	
Less than 3	20 (14.5%)
3 to less than 6	22 (15.9%)
6 to less than 9	29 (21.0%)
9 to less than 12	67 (48.6%)
Work Status	
Daily wages	35 (25.4%)
Salaried	103 (74.6%)

Table-II: General demographic characteristics of subjects.

	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Family size	138	2	15	6.58	2.358
Years of schooling	79	1	7	4.59	1.717
Daily Earning of Household	35	200	800	458.57	176.354
Monthly Salary of household	103	5000	45000	17932.04	6863.176

DISCUSSION

Assistive technology improves the functioning of children with disabilities. It plays a vital role in their development and health, as well as for participation in various facets of life which include communication, mobility, self-care, household tasks, family relations, education

and engagement in play and recreation. Thus, enhancing the quality of life of both children and their families. Although provision of assistive technologies to the children with disabilities can change their life yet there is a huge unmet need for access to these technologies. The findings of the study showed that 33.3% or all the children whose parents thought that their child could benefit from some assistive device or needed some additional product, had unmet mobility aids need which is inconsistent with the results showed by a study conducted in United States which indicated 10% unmet need for mobility aids[13].

Previous study found that 77.2% participants reported that they used and 83.3% reported of their need for assistive devices to perform activities of daily living[14] but the results of present study showed that 14.5% or all those who thought that their child could benefit from assistive devices reported of their need for the assistive products to assist in day-to-day activities. Study further revealed that most of the participants had greatest need for walking aids and different percentages of the usage of various products in different disabilities[14] which are in line with the present study. Several studies showed that the relative unmet need was greater for communication devices and lower for hearing aids[15]. The results of the present study are inconsistent with the findings of previous researches. Results showed that 3.6 or all children who were previously using the product had left it which is pretty similar to the previous researches that found 17.9% reported of abandonment of assistive devices[16]. Current study findings revealed that unawareness was the major barrier in access to assistive devices which is in contrast to the previous study that reported lack of affordability as a main barrier for not using the assistive technology[17].

Table-III: The percentage of participants who used and needed ADs as well as three AD items with the highest percentage of participants.

Category of ADs AD Items	Used (Frequency / Percentage)	Category of ADs AD Items	Needed (Frequency / Percentage)
Walking	15 (100%)	Walking	46 (100%)
Lower limb orthosis	8 (53.3%)	Lower limb orthosis	20 (43.5%)
Wheelchair	4 (26.7%)	Walking frame	17 (37.0%)
Walking frame	3 (20.0%)	Wheelchair	4 (8.7%)
Seeing	20 (100.0%)	Seeing	25 (100.0%)
Spectacles	6 (30.0%)	spectacles	11 (44.0%)
Braille	6 (30.0%)	Audio player	8 (32.0%)
Screen reader	2 (10.0%)	CCTV	3 (12.0%)
Hearing Aid & Speech therapy	11 (100.0%)	Hearing aid & Speech therapy	25 (100.0%)
Hearing aid	5 (45.5%)	Speech therapy	16 (64.0%)
Speech Therapy	6 (54.5%)	Hearing aid	5 (20.0%)
Day-to-day Activities	1 (100%)	Day-to-day activities	20 (100.0%)
Chair for shower, bath or toilet	1 (100%)	Chair for shower, bath or toilet	19 (95.0%)
		Handrail or grab bar	1(5.0%)
Assistive product in use For managing disease	11 (100.0%)	Assistive product Needed for Managing disease/health condition	21 (100.0%)
Lower limb orthosis	7 (63.6%)	Lower limb orthosis	16 (76.2%)
Walking frame	2 (18.2%)	Walking frame	2 (9.5%)
Clubfoot brace	2 (18.2%)	Clubfoot brace	1 (4.8%)

The present study also found that 34.1% (96.8%) of the study subjects were using the assistive devices and 69.6% (95.0%) reported of never used the desired product. The findings are inconsistent with the previous study that showed 92% of the participants were using the assistive devices and less than 1% had never used the devices[18]. One of the main strength of this study is that it strived to cover the gap in literature regarding the needs of children with disabilities in Pakistan. Another very important strength of the study is that it deeply analyzed the barriers encountered by the poor population of slums in their access to the basic health needs.

CONCLUSION

Although children with various disabilities had different needs for the assistive devices, yet the majority felt the need for walking aids than any other device to support them and carry out the activities of daily living. A variety of barriers in access to assistive products were identified by the study such as lack of awareness, unaffordability, unfelt need, ineffectiveness and lack of knowledge about the desired product source. Among all barriers lack of awareness being the leading cause of not using the assistive technology among the slum population of Rawalpindi and Islamabad. It is recommended that Assistive technologies for children have to be included in disability strategies and plans of action. Sufficient funding should be made to improve availability and affordability of assistive technology for children with disabilities. Awareness has to be raised and more research and development need to be supported on assistive technology for children.

LIMITATION OF STUDY

The sample size was small due to time constraints which limits the generalization of the findings. The study was purely quantitative. It would have been suggested that future studies should be carried out using mix method approach so as to get the in-depth information about the needs of the children with disabilities and the challenges faced by them in access to Assistive technology. The study was conducted in a sample of slum population belonging to twin cities (Rawalpindi & Islamabad) so the results may not be representative of other settings or stations.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

REFERENCES

1. WHO & UNICEF. Assistive Technology for Children with Disabilities: Creating Opportunities for Education, Inclusion and Participation 2015 [cited 2018 19th October]. Available from: https://www.unicef.org/disabilities/files/Assistive-Tech-Web.pdf.
2. Lynch M. Assistive Technology For Students With Disabilities 2018 [cited 2018]. Available from: https://www. theteched vocate.org/assistive-technology-students-disabilities/.
3. World Health Organization. WHO global disability action plan 2014-2021: Better health for all people with disability: World Health Organization; 2015.
4. The Borgen Project. Children with Disabilities in Developing Countries 2017 [cited 2019 11th January]. Available from: https://borgenproject.org/children-with-disabilities-in-developing-countries/.
5. Shore S, Juillerat S. The impact of a low cost wheelchair on the quality of life of the disabled in the developing world. Medical science monitor. Intl Med J Experimental Clini Res 2012; 18(9): CR533-42.
6. Bennett B, McDonald F, Beattie E, Carney T, Freckelton I, White B, et al. Assistive technologies for people with dementia: Ethical considerations. Bulletin of the World Health Organization 2017; 95(11): 749.
7. Rohwerder B. Assistive technologies in developing countries Institute of Development Studies 2018.
8. World Health Organization. Assistive devices and technologies 2018 [cited 2018]. Available from: https://www.who.int/disabilities/technology/en/.
9. National Academies of Sciences E, and Medicine,. The Promise of Assistive Technology to Enhance Activity and Work Participation. Washington, DC: The National Academies Press (US); 2017.
10. Waqar K. Disability : Situation in Pakistan 2014 [cited 2019]. Available from: http://itacec.org/document/gaw/gaw2014/2.%20 Disability%20Pages%202.pdf.
11. Colorsoflse. Challenges faced by Special Children in Pakistan 2015 [cited 2019 January]. Available from: https:// 50colorsoflse. wordpress.com/2015/03/26/challenges-faced-by-special-children-in-pakistan/.
12. World Health Organization & UNICEF. Assistive technology for children with disabilities: Creating opportunities for education, inclusion and participation 2015 [cited 2018 24th september]. Available from: http://apps.who.int/medicinedocs/ documents/ s22478en/s22478en.pdf.
13. McManus BM, Prosser LA, Gannotti ME. Which Children Are Not Getting Their Needs for Therapy or Mobility Aids Met? Data From the 2009-2010 National Survey of Children With Special Health Care Needs. Physical therapy 2016; 96(2): 222-31.

14. Yeung KT, Lin CH, Teng YL, Chen FF, Lou SZ, Chen CL et al. Use of and self-perceived need for assistive devices in individuals with disabilities in Taiwan. PloS one 2016; 11(3): e0152707.
15. Kenney MK, Kogan MD. Special needs children with speech and hearing difficulties: prevalence and unmet needs. Academic pediatrics 2011; 11(2): 152-60.
16. Federici S, Meloni F, Borsci S. The abandonment of assistive technology in Italy: a survey of National Health Service users. Eur J Physical Rehabilitation Med 2016; 52(4): 516-26.
17. Borg J, Ostergren PO. Users' perspectives on the provision of assistive technologies in Bangladesh: awareness, providers, costs and barriers. Disability and rehabilitation Assistive technology 2015; 10(4): 301-8.
18. Dijcks BP, De Witte LP, Gelderblom GJ, Wessels RD, Soede M. Non-use of assistive technology in The Netherlands: a non-issue? Disability and rehabilitation Assistive technology 2006; 1(1-2): 97-102.