

EVALUATION OF CHARACTERISTICS OF ASSISTIVE TECHNOLOGY DEVICES THAT MAY ENHANCE USAGE AND SATISFACTION WITH USE

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INTRODUCTION

Assistive Technology Device (ATD) refers to any item, piece of equipment or product system, whether acquired commercially or off the shelf, modified or customized that is used to increase, maintain or improve the functional capabilities of individuals with disabilities.¹ They are prescribed to reduce the symptoms associated with any skeletal pathology, provide support, provide better positioning, improve biomechanical function² and minimize deformity, stress and pain.³ Assistive Technology Device promotes greater independence by enabling people to perform tasks that they were formerly unable to accomplish.⁴

Despite significant advances in Assistive Technology Devices and legal mandates, these intervention often remain under-utilized.⁵ Studies have shown that the rate of abandonment of Assistive Technology Device range from 8% to 75%.⁶⁻⁹ To understand and ultimately reduce the non-usage and discontinuance of Assistive Technology Devices and increase its optimal use, there is a need to measure the outcomes of the Assistive Technology Devices and the services being provided.¹⁰

The discontinuance of ATD usage even when still indicated for the individual has been reported in some developed countries like the US and Canada.¹ This suggest a need to look at certain ATDs characteristics that may influence users' satisfaction and continual use of the ATDs since it has been reported that the most important perspective on how Assistive Technology Devices affects quality of life is that of the device user.¹¹ This study therefore is aimed at describing certain profile of ATDs' users and also determined users' perception of certain characteristics that may influence satisfaction with use.

METHODOLOGY

The study was a survey of individuals receiving physiotherapy treatment and for whom Assistive Technology Devices have been prescribed in some selected Federal and State Hospitals in South-Eastern Nigeria. These hospitals were Nnamdi Azikwe University Teaching Hospital Nnewi, Anambra State, National Orthopaedic Hospital Enugu, Enugu State, University of Nigeria Teaching Hospital Enugu, Enugu State, Parklane Hospital Enugu, Enugu State and Federal Medical Centre Owerri, Imo State.

A two-part questionnaire was used to collect data for this study. Part A comprised questions which sought information about users, prescribers of ATDs and conditions necessitating prescriptions of ATDs. Part B comprised questions on various ATDs' characteristics which may influence satisfaction with use. Copies of the questionnaire were administered on the participants at the physiotherapy departments of the selected hospitals. Obtained data was analysed using descriptive statistics of frequency count, percentages, mean and standard deviation.

RESULT

A total of sixty qualified participants volunteered for this study. The average age of the participants was 40.466 ± 23.47 years and 63.3% of the participants were male. Majority of the participants had their ATDs prescribed by physiotherapist (60%) (Table 1) and crutches (28.3%) and canes (23.3%) were the most-prescribed ATDs (Table 2).

A great number (33.4%) of study participants were afflicted by conditions characterized by muscle paralysis (post-polio syndrome, paraplegia and paraparesis), while about 17% of them had the ATDs prescribed due to a diagnosis of osteoarthritis (Table 3). More than 70% of participants rated their ATDs as either good or excellent in terms of appropriateness to physical disability, effectiveness, compatibility, dependability, durability and portability. The ATDs were rated poorly in terms of consumer reparability by 55% of participants while about 40% rated them poor in terms of social acceptability (Table 4).

A good number of the participants (70% and above) also found their ATDs easy to assemble, maintain, use and operate while more than half found it difficult affording the ATDs. Use of ATDs in diverse settings was also found difficult by about 40% of respondents. Overall, over three-quarters of study participants reported their ATDs as satisfactory. (Table 5)

TABLE 1: Frequency Distribution Table Showing Different Prescribers of Participants ATDs

PRESCRIBER	FREQUENCY	PERCENTAGE
Physiotherapist	36	60%
Doctors	15	25%
Family/friends	2	3.3%
Self	5	8.3%
Others	2	3.3%

TABLE 2: Frequency Distribution Table of Number of Participants using Particular ATDs

Assistive device	Frequency	Percentage
Cane	14	23.3%
Manual Wheelchair	8	13.3%
Crutches	17	28.3%
Zimmers Frames	4	6.7%
Lumbar Corset	4	6.7%
Shoe Raise	2	3.3%
Knee Brace	3	5.0%
Callipers	6	10.0%
Walkers	1	1.7%
Minerva Jacket	1	1.7%

Table 3: Frequency Distribution of Various Conditions Necessitating ATDs Prescription and Use

CONDITIONS	FREQUENCY	PERCENTAGE
Osteoarthritis	10	16.7%
Low back pain	3	5%
Cerebrovascular accident	7	11.7%
Post polio syndrome	7	11.7%
Paraplegia	6	10%
Paraparesis	7	11.7%
Amputation	2	3.3%
Foot drop	1	1.7%
Fracture	1	1.7%
Lumbar spondylosis	1	1.7%
Patellar dislocation	1	1.7%
Post osteotomy	9	15.0%
Avascular necrosis	2	3.3%

TABLE 4: Frequency Distribution of Participants Rating of ATDs Characteristics in Terms of Quality

PROPERTY	POOR	GOOD	EXCELLENT	NO RESP
Effectiveness	6 (10%)	44 (73.3%)	10 (16.7%)	-
Dependability	9 (15%)	45 (75.5%)	6 (10%)	-
Compatibility	17 (28.3%)	38 (63.3%)	5 (8.3%)	-
Flexibility	4 (6.7%)	21 (35%)	7(11.7%)	28(46.7%)
Physical security	1(1.7%)	31(51.7%)	17(28.3%)	11(18.3%)
Durability	7(11.7%)	38(63.3%)	13(21.7%)	2(3.3%)
Portability	7(11.7%)	42(70%)	11(18.3%)	-
Securability	5(8.3%)	36(60%)	6(10%)	13(21.7%)
Personal acceptability	19(31.7%)	27(45%)	13(21.7%)	1(1.7%)
Social acceptability	23(38.3%)	33(55%)	4(6.7%)	-
Consumer reparability	33(55%)	20(33.3%)	6(10%)	1(1.7%)
Supplier reparability	8(13.3%)	40(66.7%)	9(15%)	3(5%)
Appropriateness PA	6(10%)	40(66.7%)	9(15%)	5(8.3%)
Appropriateness VA	6(10%)	13(21.7%)	10(16.7%)	31(51.7%)
Physical comfort	7(11.7%)	42(70.0%)	9(15%)	2(3.3%)
Adequate staff support	5 (8.3%)	42 (70%)	12(20%)	1(1.7%)

Appropriateness PA=Appropriateness to physical ability

Appropriateness VA=Appropriateness to visual ability

TABLE 5: Frequency Distribution of Participants Rating of the Ease of ATDs Characteristics

PROPERTY	VERY EASY	EASY	DIFFICULT	NO RESP.
Ease of maintenance	11(18.3%)	33(55%)	12(20%)	4(6.7%)
Ease of assembly	12(20%)	38(63.3%)	6(10%)	2(3.3%)
Ease of use	18(30%)	31(51%)	9(15%)	4(6.7%)
Operability	15(25%)	35 (58.3%)	6(10%)	4(6.7%)
Affordability	17(28.3%)	9 (15%)	32(53.3%)	2(3.3%)
Ability in DS	17(28.3%)	17(28.3%)	23(38.3%)	3(5%)
Overall satisfaction	10(16.7%)	36 (60%)	10(16.7%)	4(6.7%)

NO RESP=No response

Ability in DS=Ability in Diverse Setting

DISCUSSION

Sixty participants comprising 63.3% males were involved in this study. About half of study participants have conditions characterized by some form of muscular paresis or paralysis. The high use of Assistive Technology Device by males could be because they are more prone and involved in high risk activities like palm-wine tapping and reckless driving. They are thus likely to have a higher predisposition to painful and debilitating injuries, necessitating the use of ATDs. The predominance of conditions characterized by gross muscle weakness among the study participants might also be responsible for while canes, crutches and manual wheelchairs are the most commonly used. Reimer-Reiss and Wacker¹ also found mobility devices to be the most-frequently used ATDs in their study of college students.

Majority of the Assistive Technology Devices were prescribed by physiotherapists and this was to be expected. Aside the fact that participants were recruited from physiotherapy clinics, the fact that a good number of individuals requiring the use of ATDs presented with disease conditions (osteoarthritis, paraplegia, post-osteotomy and post-polio syndrome) that affects mobility and functional ability and therefore physiotherapy intervention are also to be considered. The scope of training for the physiotherapist requires that he understands the indication and be able to assess the need for ATDs prescription, take appropriate measurements for it, be able to apply the ATDs on the patients and also teach its proper usage.

An appreciable number of the participants were satisfied with the Assistive Technology Devices they are using and some of the qualities of the Assistive Technology Devices that the individuals are satisfied with includes effectiveness, durability, operability and dependability (reliability), which had been documented as some of the characteristics

associated with the increased use of ATDs.^{12,13,14} More than sixty percent of the participants also scored their ATDs high in terms of personal acceptability, compatibility, portability and appropriateness to physical ability and as well as not interfering with their physical ability. ATDs were rated poorly by about 40% of participants in terms of social acceptability. It seems our local society is yet to grasp the necessity for the use of ATDs for enhancement of functional ability and some people may rather prefer having the individual restricted to their homes than performing societal roles and functions with the aid of ATDs. This view can be very limiting and restrictive for the individual for whom ATDs had been prescribed. Fortunately in this study however, it seemed not to be strong enough to interfere with personal acceptance of the ATDs. ATDs were also rated low by many in terms of consumer reparability. There is a dearth of technicians skilled in ATDs repair in our environment, users may thus have to wait a long time or travel far distances to effect a repair and this may be quite frustrating. 53.3% of the participants found the cost of Assistive Technology Devices rather prohibitive, Reimer-Reiss and Wacker¹ reported some college students as having difficulty getting an assistive technology device due to its high cost. The situation might have been further worsened in our environment due to the poor development of the ATDs industry here and the ever-increasing cost of foreign exchange. About 40% of the participants had great difficulty using their Assistive Technology Device in various settings which could be attributed to the fact that most public building and transport system were constructed without considering individuals using ATDs.

Conclusively, ATDs were rated fairly well in terms of characteristics which might influence satisfaction with use and also in terms of ease of use. There may however be a need for government to subsidize the cost and also put machinery in motion to enhance the development of a local industry.

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