ASSESSMENT OF EXISTING DISTRIBUTION MECHANISM OF ASSISTIVE MEDICAL DEVICES AND TECHNOLOGY TO PEOPLE WITH DISABILITY (PWD) IN DUBAI, UAE

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Background: WHO estimates that over one billion people with disabilities need one or more assistive medical products. As the global population progressively ages and prevalence of non-communicable diseases rises, the number of people needing assistive products is projected to increase beyond two billion by 2050. Dubai Strategy for people with disability (PWD) 2015 and Dubai inclusive health policy for PWD 2018 provided a conducive environment to for empowerment of the PWD. Currently several organization/authorities in Dubai distributes Assistive Medical Devices & Technology (AMDT) to PWD according to their convenient mechanism, which is deficient and seamless AMDT distribution process. In addition to unavailability of central database information on all PWD, it’s also challenging to reach them. There is eminently limited research and studies conducted in this area.

Purpose: The survey aimed to understand the gaps in existing distribution mechanism of AMDT and to identify the obstacles contributing to equitable access of AMDT for homecare patients registered under the catchment of 12 Primary Healthcare centers in Dubai Health Authority (DHA).

Methods: An online survey questionnaire using Google Form developed in both Arabic and English. It included demographic information of respondents. It is composed of 22 questions that covered six area related to AMDT distribution mechanism. Google Form is an open source survey administration app offered several positive attributes and allows collecting information from users via a personalized survey. The survey was pretested before administering it. The survey link was shared to all registered PWD and 459 PWD responded. The quantitative data analyzed using a range of software tools for descriptive statistics. The qualitative data analyzed using grounded theory with manually coding for open-ended question.

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**Result:** The analysis showed that 68.9 percent PWD were using AMDT and it is helping only 53 percent PWD to live independently. Study Results showed that about 65 percent of AMDT cost covered by PWD and 54.9 declare lack of accessibility due to high cost. The majority of the PWD and caregivers 66.5 percent were received training and 49.1 percent of AMDT maintenance were provided by device provider.

**Conclusion and Recommendation:** The current AMDT distribution system for PWD is fragmented, deficient and not responding to the needs of PWD as there was no equal access to appropriate AMDT because of the many factors that hinder the equitable distribution of AMDT. Therefore it is obligatory to develop a unified AMDT distribution mechanism to ensure equitable accessibility, availability and affordability through insurance and charity organizations. Support distribution mechanism to update implement, monitor and evaluate AMDT process for better access and distribution to improve quality of life.

**Introduction:**

Disability is complex, dynamic, multidimensional, and contested. Disability is part of the human condition. Almost everyone will be temporarily or permanently impaired at some point in life and those who survive to old age will experience increasing difficulties in functioning [1].

WHO estimates that over one billion people need one or more assistive products. The mainstream of these are people with disabilities. As people age, including those with disabilities, their function debilities in several areas and hence their necessity for assistive products increases.

As the global population progressively ages and prevalence of non-communicable diseases rises, the number of people needing assistive products is projected to increase to beyond two billion by 2050 [2]. This is likely to place additional burdens on the provision of health care services to this demographic. Many medical devices are available that may benefit elderly people, although these devices may be expensive or may not be available in all countries. These factors impede equitable access to medical devices [3].

Dubai Strategy for people with disability 2015 and Dubai inclusive health policy for people with disability 2018 provided a conducive environment for empowerment of the people with disability it includes AMDT and related services that improve the functioning of people with disability such as communication, mobility, self-care, household tasks, family relationships, public, culture, sport life, education, engagement in play and recreation [4].

The people with disabilities along with the lack of caregiver’s coerces AMDT to patronage people in their daily lives. Nowadays, assistive medical device and technology is required mostly by the (Figure 1) older people, PWD with non-communicable, mental health condition come in many forms and can be used in many ways to support.
AMDT empowers people to live healthy, productive, independent and dignified lives to participate in education, employment market and civic life. Assistive products and technology can also assist to reduce the need for formal health and support services, long-term care and the work of caregivers. Without assistive products and technology, people may suffer exclusion, and are at risk of isolation, poverty and may become a burden to their family and on society [2]. Example Child with a disability should to play with other children; go to school and be educated; and to become a successful citizen and contributing member of society. It enriches the quality of the life of the people of determination and their families and facilitate them to practice their daily deeds and including them in society while continuing their enjoyment of the highest levels of health, which has the effect of enhancing their overall level of life [5].

Enabling PWD’s to remain healthy, active and independent is a priority. This priority first step (Figure 2) can be attained through increasing the accessibility, acceptability, adaptability, affordability, and availability of high quality AMDT. To ensure this, a first step is to assess the needs and situations of people of disability.
The affirmative impact of AMDT goes beyond improving the health and well-being of individuals and their families. There are also socioeconomic benefits to be gained, by virtue of reduced direct health and welfare costs such as recurrent hospital admissions or state benefits and by enabling a more productive labour force, indirectly stimulating economic growth [6].

“Human disability is the lack of progress, survival in place and inability to make achievements. What the determined ones in various fields of achievements have achieved is a proof that determination and will can achieve the impossible and push the person to face all the circumstances and challenges consistently to reach the goals and objectives”. (His Highness Sheikh Mohammed bin Rashid Al Maktoum) [7].

UAE healthcare administrators have had considerable interest in innovating and modifying all basic tools and aids that facilitates life for this vital segment of the community, which expected to positively affect the quality of healthcare services [8].

According to Community Development Authority Social Survey 2018, Dubai the estimated prevalence of disability among Emiratis is 3.7 percent (8,952), whereas the Non-Emiratis 2.1% (5,808) [9]. The Dubai household health survey 2014 - study showed that about 13.8% of Emirati (males) are having moderate to severe disability, while 6.9% of non-Emirati (males) are having moderate to severe disability. Approximately 8.5 % population of Dubai have moderate to severe disability as per this statistical survey [10].

Dubai raising up the quality of healthcare services to international best practices by 2021[11]. In essence, moving in and out of the homes is no longer a problem for PWD in the UAE, which is ahead of several other countries in offering better mobility technology for PWD. Currently, Dubai is introducing modern technologies to help PWD regardless of the severity of their disabilities by designing aids that fit all segments according to engineering studies that have been recognized by leading global manufacturers.

According to UAE ahead in offering better mobility technology for People of Determination, Press Release Dubai October 13, 2019,: Moving in and out of the homes is no longer a problem for People of Determination in the UAE, which is ahead of several other countries in offering better mobility technology for People of Determination. A private national companies have innovated a number of solutions to help People of Determination move around and become self-reliant with better mobility to enable them become one of the community’s productive segments and contribute to nation-building [12].

Furthermore, International Exhibition for People with Disabilities, 5-7 Nov 2019, revealed that UAE attempts to benchmark itself against the developed countries as the official authorities stress the importance of integrating PWD in the community and making use of their expertise, while also encouraging them, developing their skills and exploring their talents [12]. However, various factors like the distribution, performance, training; evaluation etc. of AMDT directly affects PWD safety and health. PWD engagement is a key step to ensure of safety and quality [13].

**Purpose Of The Study:**
The study is carried out with the following objectives to:
1. Understand the gaps in the existing distribution mechanism of AMDT to registered PWD in Primary Healthcare Centers in Dubai.
2. Identify the barriers contributing to equitable access of PWD to AMDT.

**Method:-**

**Survey approach:**
A survey tool was developed, consisted of demographic information and other questions related to AMDT access and mechanism. In the following areas:
1. Questions relating to using, system and ancillary aspects of AMDT.
2. Training and knowledge of AMDT.
3. Possible barriers, loaning approach.
4. Current use of AMDT
5. Maintenance of AMDT
6. Easy information platform.
7. Recommendation to improve the access and distribution.
The set of survey questionnaires were designed based on WHO survey of needs for assistive & medical devices for older people in six (6) countries and customized based on region needs [5]. These initial questionnaires circulated through the DHA Disability specialized staff who are working with PWD to test validity and reliability of the tool. The survey questionnaire was finalized after further garner feedback and adopted as the quantitative and qualitative tool.

**Building the survey tool- assistive medical devices:**
The questions framed around functions deemed most important for PWD in maintaining their independency and then the respondents were asked a series of AMDT related question:
1. Type of functional disability
2. Determining accessibility, acceptability, adaptability, affordability and availability
3. Garner feedback to enhance access to AMDT.

**Implementing the survey:**
The survey questionnaire was developed in Arabic and English bilingual using Google Form.

Google Form is an open source survey administration app that allows collecting information from users via a personalized survey [14].

The first draft of the online bilingual survey was pretested by team members and Corporate Quality Development Office, DHA for pilot survey in Feb 2020 and revise. The survey was transferred on Google Form.

A Google Form Survey link was sent by mobile SMS to the registered PWD in the 12 Primary Health centers of Dubai which include Nad Al Hamar Health Center, Al Towar Health Center, Al Mamzar Health Center, Al Khawaneej Health Center, Al Mizhar Health Center, Al Mankhool Health Center, Al Badaa Health Center, Zabeel Health Center, Al Safa Health Center, Al Barsha Health Center, Nad Al Shiba Health Center and Al Lusail Health Center.

Only 459 PWD have participated at 95% confidence level with the margin error of four (4). The online survey linked was open from March 1st to April 30th 2020 i.e. for 2 month duration, in order to capture adequate response. The survey results database was downloaded in full on May, 3rd 2020 for analysis.

**Survey analysis:**
The raw data was downloaded from the Google Form at the end of the survey period and the quantitative data analyzed using a range of software tools for descriptive statistics, measure of variability method to analysis data as meaningful.

The qualitative data analyzed using inductive, grounded theory [15] for easier and faster manually code open-ended question.

**Limitation of the survey:**
The survey had limitations that should be considered for interpreting the findings, as well as for planning of future surveys.
1. There were very few respondents reflecting their perceptions of end-user beliefs for some questions.
2. The small number of respondent meant that one has to be cautious in generalizing from the findings. When conducting any type of research it is beneficial to carry out the research on a larger and more in-depth scale in order to allow a more comprehensive analysis of the study. There were good response received and provided very useful information and meaningful data however, sample size should be increased to get more response.

**Results:-**
AMDT are products and allied health services that significantly affect the functioning of PWD and their safety which led to increase in their satisfaction level. In essence, AMDT enables PWDs to live healthy, productive, and independent allow them to participate in several civic life activities [16].

Findings show that the respondents’ characteristics have been broken down into five main groups, which are gender, nationality, marital status, occupation and level of education. In total, 459 users and caregivers were involved in this
study (the sample included both males and females), where 285 were females (61.6 percent) while males were 174 (38.4 percent).

There are several reasons for the high percentage of female respondents in this study, because the majority of the sample of caregivers in this study has been taken from clinics where most of the employees are females. In Dubai Health Authority, most of the staff working in the clinics are females female patients tend to accept females particularly in pediatric and gynecology specialist clinics where most of the patients are females and children.

Regarding nationality, the sample consisted of 98.6 percent Emirati and 1.3 percent non-Emirati. The higher proportion of Emirati participants was attributed to the fact that the study was conducted in the public sector, where a high proportion of Emirati patients have health insurance; hence, they receive free treatment.

Concerning the distribution of participants by marital status, findings show that the majority of the respondents 54.6 percent were married. Regarding education level, 8.5 percent of the participants had bachelor degrees, and about 9.6 percent had high school certificates. Further results were close to 69.5 percent of the participants were students and 21.1 percent of they were retired.

However, this indicates that the study succeeded in reaching people with diverse linguistic and socioeconomic backgrounds. Concerning the usage of assistive device among PWD, results revealed that the majority of participants 68.9 percent were using AMDT.
Among the device users 35 percent of them were collaborating with DHA for AMDT while 20 percent were getting them from other Ministries, authorities and organizations such as MOCD, MOHAP, CDA, charity organizations, youth clubs, where as 45 percent obtain their AMDT by other means.

The results also showed the DHA’s user and caregivers 84.1 percent received their services through DHA home care services, where the majority of them 48.6 percent were traveling less than 10 Kilometers to receive the required AMDT.

In an attempt to interpret the results, the extracted factors were assigned labels. “Training on using assistive medical device technology” and “device maintenance” were two of the study’s factors that had two items, and the findings revealed that the majority of the users and caregivers 66.5 percent were received training on using AMDT.
49.1 percent of AMDT maintenance were provided by device provider. These results indicate that the users and caregivers had a required training on how to use the AMDT, and that device provider conducted regular maintenance sessions. Notably, For PWD, AMDT is the lifeline that provides them access to and control over their environment including the home, school and greater community. AMDT frequently represents their sole means by which to communicate, learn, develop social relationships, and benefit from school and life experiences. In addition to the provision of devices and strategies, training in the use of AMDT must also be provided to ensure effective and successful outcomes.

![AMDT Maintenance](image)

The results further revealed that about 59.2 percent of the participants were using their AMDT for more than 10 years, 53 percent of participants stated that AMDT actually helping them to live independently. This indicate that they had a good level of experience in using them and that they were gotten a considerable outcome from using AMDT.

![AMDT Role on Individuals Functioning & Independence](image)

Study Results showed that about 65 percent of AMDT cost was covered by themselves, while only 30 percent sponsored by charity organization and insurance schemes collectively.
The results also denoted to the fact that the users and caregivers strongly declare and believe that high cost 54.9 percent, lack of funding 36.2 percent, lack of knowledge of obtaining process 22 percent and long insurance approval were main barriers to get right AMDT.

In addition, the results indicated that the majority of respondents 43.5 percent agreed that borrowing AMDT for short period would not be helpful, whereas 36.4 percent of respondent’s supported borrowing AMDT for short period of time to reduce waiting time [17]. Furthermore, the users and caregivers were preferred to get information about the availability of AMDT through various channels such as through SMS 75.7 percent and Mobile Application 42.8 percent.

The results revealed that the majority of the participants 61.1 percent were satisfied with the current process of obtaining AMDT where 29.4 percent of them were dissatisfied.
Finally, the grounded theory with manual coding results have identified the need for the government to develop AMDT process, which provides free AMDT or funding/Insurance coverage for AMDT and provide training to PWD.

**Conclusions:**
The survey underlines the methodology, provided expedient information in identifying the gaps, barriers and use of Assistive Medical Device and Technology in support of PWD. The survey was efficacious in obtaining useful information for the 12 Primary Health Centers in Dubai. A list of priority needs for AMDT distribution to meet consistent functional activity in PWD was produced and can be used as the basis for further discussion.

The grounded theory and descriptive statistics revealed noteworthy recommendation that AMDT approval process shall be seamless, smart and cost shall be covered under insurance and charity organization to eliminate barriers. Recommending physician/therapist/organization shall cognizant PWD and family members on AMDT obtaining process and training on usage and maintenance process.

The governance have to develop AMDT distribution mechanism to ensure equitable accessibility, availability and affordability through insurance and charity organizations. Support distribution mechanism to update implement, monitor and evaluate AMDT process is one area with enormous potential for better access and distribution to improve quality of life, mobility and independency [18] and common strategies to reduce disability [19].

**Acknowledgement:**
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**References:**

Annexure:-

Appendix 1: Management of Assistive Medical Devices for POD in Dubai Survey - 2020
Dear participant
DHA leadership acknowledge the importance of having an assistive medical device policy for people of determination (POD) in Dubai and uphold the objective of ensuring “improved access, quality and use of assistive medical devices and technologies.” This survey has been developed to determine an effective management of assistive medical devices distribution for People of determination in Dubai. Kindly share your views and suggestions for the development and improvement of the process. The participation is voluntary and will take approximately 5 minutes to complete the survey. Therefore, kindly cooperate with us in completing the survey by answering the questions and choosing the answers that best reflect the impressions that you have developed about this

المشارك عزيزي

 الوصول سيولة تحسين" ضمن بهدف في يهم ل أصحاب المساعدة الطبية للأجهزة سياسة لتطوير خاصا اهتماما بدي في الصحة يتعالى "المساعدة الطبية والتقنيات الأجهزة واستخدام وجودة بارانك شاركنا برجى. دبي إبارة في يهم ذوي blends المساعدة الطبية الأجهزة لتوزيع الفعلاة الإدارة المستوى لتحديد الاستبانين هذا لتطوير تم وقفل وتحسينها عملية للتطوير واقتراحاتكم.

 الاسلحة على الإجابة خلال من الاستبانين استبانا في معا التعاون برجى تلك الاستبانين استبانا دفقة 5 حوالى تستغرق وسوف اختيارك المشاركة الموضوع هذا حول لديك التي الابطباء تتكنت التي الإجابات واختيار

1. Which Health center (Catchment area) you belong to? [………. Health Center]

2. Gender/الجنس
o  ( ) Male/ ذكر
o  ( ) Female/ أنثى

3. Nationality/ الجنسية
o  ( ) UAE/ مواطن
o  ( ) Non UAE / وافد

4. Marital status/ الاجتماعية الحالة
o  ( ) Married / متزوج
o  ( ) Single / أعزب
o  ( ) Divorced/ مطلق
o  ( ) Widowed/ أرمل

5. Profession/ Occupation/ المهنة
o  ( ) Student/ طالب
o  ( ) Public sector employee/ حكومي موظف
o  ( ) Private sector employee/ خاص قطاع موظف
o  ( ) Self-employed/ حرة أعمال
o  ( ) Retired/ متقاعد
o  ( ) Unemployed/ العمل عن عائد

6. Education/ التعليم الموهد
o  ( ) Uneducated/ أمي
o  ( ) Elementary/ ابتدائية شهادة
o  ( ) Secondary school/ اعدادية شهادة
o  ( ) High school/ ثانوية شهادة
o  ( ) University or college/ جامعي
o  ( ) Higher education (Master/PhD)/ (دكتور/ماجستير) علي تعليم

7. Select the facility where you are currently getting the services/ الخدمات على حالياً فيه تحصل الذي المرفق حدد
o  [ ] DHA Home care services/ الصحة هيئة في المنزلية الرعاية خدمات
o  [ ] DHA Rehabilitation/ Early intervention/ الصحة هيئة في المنزلية الرعاية خدمات
o  [ ] DHA Elderly care/ الصحة هيئة في السن كبار رعاية
o  [ ] MOCD Rehabilitation Centre/ المجتمع تنمية وزارة في التأهيل مركز
o  [ ] CDA/ المجتمع تنمية هيئة
o  [ ] Others/ آخر

8. Please indicate yourself in below option/ أداء الخيار في يناسبك ما إلى الإشارة يرجى
o  ( ) People of determination using assistive medical device/ مساعد طبي جهاز باستخدام وتقوم اليوم أصحاب من
o  ( ) A family member of People of determination using assistive medical device/ الهم أصحاب أسرة أفراد من فرد/
o  ( ) Others/ آخر

9. Please select the type of disability/ الإعاقة نوع تحديد يرجى
o  ( ) Intellectual Disability/ الذهنية الإعاقة
o  ( ) Communication disorders/ التواصل اضطرابات
o  ( ) Autism Spectrum disorders/ التوحد طيف اضطرابات
o  ( ) Attention deficit hyperactivity disorder/ النشاط وفرط الانتباه فقد اضطراب
o  ( ) Specific learning disorder/ المحدد التعليم اضطراب
o  ( ) Visual impairment/ البصر ضعف
o  ( ) Hearing impairment/ السمع ضعف
o  ( ) Hearing and visual impairment/ السمع البصر ضعف
o  ( ) Physical disability/ جسدية إعاقة
o  ( ) Psycho-emotional disorders/ والعاطفية النفسية الاضطرابات
o  ( ) Multiple disability/ المتعددة الإعاقة
o  ( ) Others/ آخر
10. Have you ever obtained assistive medical devices for yourself or for a user in your family?

( ) Yes/

( ) No/

( ) NA/

11. Where do you get most assistive medical devices?

( ) DHA/

( ) MOCD/

( ) MOH/

( ) CDA/

( ) Charity/

( ) Youth Club Private Sectors/

( ) others/

12. How far did you travel to receive your assistive medical device?

( ) 0-10 Kilometers ( )

( ) 11-15 kilometers ( )

( ) Others ( )

13. Have you received trainings on using the assistive medical devices given to you?

( ) Yes/

( ) No/

( ) NA/

14. Who paid the financial cost of the device?

( ) Myself/ family /

( ) Charity/ خيرية مؤسسة

( ) Insurance/ التأمين

( ) Others/ غير

15. Since how long are you using assistive medical devices?

( ) 0-5 years ( )

( ) 6-10 years ( )

( ) More than 10 years ( )

( ) Others ( )

16. In case of your device needed a maintenance where do you go?

( ) Providers’ workshop ( )

( ) Private workshops ( )

( ) I myself do the repair ( )

( ) Not applicable ( )

( ) Others ( )

17. Is assistive medical devices helping for your independence? (Check all that apply)

( ) Independent living/ الاستقلال

( ) Accessible to Work place/ العمل مكان الوصول

( ) Community activities/ الاجتماعية

( ) Learning/ التعليم

( ) Others/ آخر

18. Are you satisfied with the current process of obtaining assistive medical devices?

( ) Yes/نعم
19. What are the biggest barriers that you faced in getting the right assistive medical device?(Check all that apply)

- [ ] High cost/التكلفة
- [ ] Lack of funding/تمويل وجود عدم
- [ ] Lack of training/التعليم
- [ ] Long insurance approval process/التأخير الطويل لمراقبة الاجراءات
- [ ] Purchased wrong assistive medical device/الصيانة الطبية الجهاز خاطئ
- [ ] Inconvenience from using assistive medical device/الصيانة الطبية القصير المدى
- [ ] Lack of knowledge on how to obtain an assistive medical device if needed/الصيانة الطبية
- [ ] Lack of proper recommendations and counselling by skilled professionals/المختصين
- [ ] No barriers/لا
- [ ] Others/أخرى

20. In your opinion, does allowing individuals to borrow assistive medical devices for short periods will be helpful?

- [ ] Yes/نعم
- [ ] No/لا
- [ ] NA/لا
- [ ] May be/محتمل

21. How would you like to get information about availability of assistive medical devices?

- [ ] SMS (النصية القصيرة)
- [ ] Email (البريد الإلكتروني)
- [ ] Website (الموقع الإلكتروني)
- [ ] Mobile Application (تطبيق هاتف)
- [ ] Others/أخرى

22. In your opinion, how can we improve the service related to assistive medical devices for POD in Dubai?

Please write your suggestions here: ...........................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................