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Physical Disabilities in Greco Roman Egypt and Measuring the Role of Archaeological Museums in The Innovation of Smart Technology to Serve the Physically Handicapped Tourists: Applying on Museums in Alexandria, Cairo

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In ancient Egypt, physical disabilities were sometimes seen as divine attributes granted by the gods, and there were various remedies mentioned in medical and magical texts for conditions like blindness. However, depictions of figures with disabilities in ancient Egyptian art were rare. There were statues, reliefs, and drawings showing people with body deformities or physical impairments, but they were not commonly portrayed.

In contrast, the ancient Greeks had a different view of disabilities, often considering them punishments from the gods for misbehavior and sin. Alexander the Great, however, created an elite group of disabled men and placed them in positions of authority, showcasing a different perspective.

In the Greco-Roman world, dwarfs held significant roles in government offices and festival rites, gaining popularity during that time. On the other hand, ancient Romans had a harsh attitude towards disabled and deformed children, sometimes resulting in their unfortunate fate.

In the present day, museums can use various marketing techniques, including word of mouth and digital technologies like websites and social media, to make their collections accessible to people with disabilities. Tactile models and electronic gloves allow individuals with visual impairments to interact with artworks, and providing charging points and ramps accommodate those using electric wheelchairs. This inclusive approach ensures everyone can enjoy and appreciate museum exhibits.

Introduction

The disabled person has long-term physical, mental, intellectual, or sensory impairments¹ that can limit their movement, senses, activities, and overall functioning². Barriers based on

¹ Hagrass, H. (2005). Definitions of Disability and Disability Policy in Egypt. In G. Barnes C. and Mercer, *The social model of disability: Europe and the majority world's*. Leeds, England: The Disability press. pp. 148-162; ¹ Fioranelli, M. (2015). Historical Evolution of Disability Concept. *History of Medicine and Ethics Journal*, 1(1), 1-9.

age, sex, social, and cultural factors can hinder their full participation in society on an equal basis with others³. In Greco-Roman antiquity, disability was not categorized separately, and there are significant differences between the ancient and modern Western world's treatment of disabilities⁴.

Museums are required to be accessible as per UNESCO's 1960s "Recommendation concerning the Most Effective Means of Rendering Museums Accessible to Everyone⁵." To cater to the growing disabled market in the tourism industry⁶, it is crucial to have a deep understanding of their needs and provide adequate support services, including accessible infrastructure⁷. Museums can introduce educational facilities for visually impaired visitors, offer free wheelchairs, create separate entrances, and provide tactile objects and books, ensuring a safe and enjoyable experience for people with disabilities⁸.

Museums have developed educational programs tailored to the specific needs of individuals with disabilities, accommodating each group's⁹ unique challenges. They offer diverse programs and services for people with mobility limitations, those who are blind or partially sighted, and individuals who are deaf or hard of hearing. These initiatives aim to provide inclusive and enriching experiences for all visitors with disabilities¹⁰.

(1) Historical context of Disability in ancient Egypt

Ancient Egyptian society did not carry any religious stigma or negative societal sentiment towards physical disabilities¹¹; rather, disabilities were considered divine attributes granted by the gods. Gods were sometimes depicted with misshapen bodies or as dwarfs, like the god Bes. Disabled individuals were even able to reach high positions in the ancient Egyptian court, showcasing societal acceptance¹². Artistic depictions in tombs and excavated objects often

² Morris, A. F. (2022). *Plato's stepchildren : disability in Ptolemaic Egypt and the Hellenistic world (332-30 BCE)*. Middlesbrough: Teesside University.PP.1-593; Zakrzewski, S. R. (2014). Palaeopathology, disability and bodily impairments. In R. C. Metcalfe, *Palaeopathology in Egypt and Nubia: A Century in Review*. Oxford: Archaeopress Egyptology. pp. 57-68.

³ Fioranelli, M., Historical Evolution of Disability, 1-9; El-Moselhy, E. A., El-Azab, R. M., Khalifa, H. O., Abd-Allah, E. S., Ebrahim, A. M., El-Masry, H. M., . . . Seif, H. S. (2005). Epidemiological Study of The Childhood Disabilities: A Household Survey in Four Egyptian Governorates. *The Egyptian Journal of Hospital Medicine*, 20(1), 66-82; Heba Mahran & Samar Mostafa Kamal. (2016). Physical Disability in Old Kingdom Tomb Scenes. *Athens Journal of History*, 2(3), 169-192. doi:10.30958/ajhis.2-3-2

⁴ Manfred, H. (2012). Disability and Rehabilitation in the Graeco-Roman World. In R. Breitwieser, *Studies in Early Medicine 2, Behinderungen und Beeinträchtigungen/Disability and Impairment in Antiquity*. OXFORD: Bar Publishing. pp. 1-9; Darren W. Minarik & Timothy Lintner. (2013). Disability History: Humanity Worth Defending. *The Ohio Social Studies Review*, 50(2), 15-21.

⁵ Yıldız, S. (2019). A Holistic View on Contemporary Art Museums in the Context of Accessible Tourism-Case Studies from Central Europe. *International Conference on Tourism and Architecture*. 9. Safranbolu: Karabük Üniversitesi Sosyal Bilimler Enstitüsü Dergisi. pp. 337-348.

⁶ Ismael, M. (2019). EXPLORING THE EFFECT OF EMOTIONS ON MOBILITY-DISABLED TOURISTS' EXPERIENCE AT MUSEUMS. *European Journal of Hospitality and Tourism Research*, 7(1), 9-22.

⁷ زينب صادق مصطفى، حسن عبد علي. (٢٠٢٠). سياحة ذوي الإعاقة متطلباتها في السفر الإقامة الإرشاد السياحي (المجلد ١). القاهرة: دار الوفاق للنشر والتوزيع. ص ١-٩٤

⁸ Suboohi Nasrin& Abduraheem K.& Mhd. Shahid. (2022). Museums help people with disability: A special focus on education of visual disability. *INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN TECHNOLOGY*, 8(9), 470-474.

⁹ Argyropoulos, Vassilis&Nikolarazi, Magda&Kanari, Charikleia&Chamonikolaou, Sofia. (2017). Current and future trends in museums regarding visitors with disabilities: the case of visitors with visual impairments. *9th ICEVI European Conference "Empowered by dialogue"*. Bruges, Belgium: ICEVI EUROPE. pp. 32-33

¹⁰ Caroline Braden & The Henry Ford. (2016). Welcoming All Visitors: Museums, Accessibility, and Visitors with Disabilities. *Museum Studies Program*, pp. 1-15.

¹¹ Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593

¹² Heba Mahran & Samar Mostafa Kamal, Physical Disability in Old Kingdom Tomb Scenes. PP.169-192

showed physical disabilities, deformities, or diseases, further reflecting the culture's acceptance of disability¹³. Amulets held special significance for their owners, believed to have magical healing properties for any physical weakness or disability they might suffer, with some models resembling limbs to attract magical strength for healing¹⁴.

Ancient Egyptians practiced medicine with advanced techniques, including anatomy and surgery¹⁵. Imhotep, a person or priest of Ra during the third dynasty, established a healing center in Memphis dedicated to the blind and the deaf¹⁶. The moral instructions in ancient Egypt emphasized respect for people with disabilities, as seen in the teachings of Amenemope, which discouraged mistreating or mocking individuals with impairments¹⁷. Interestingly, retired war veterans with physical impairments often held elite positions in society, as their bodies were no longer fit for combat but were respected for their service¹⁸.

Ancient Egyptians attributed diseases and pain to hostile divinities or demons, and they believed that magical or religious incantations could cure these ailments¹⁹. Medical papyrus from the predynastic period included information about various diseases, including blindness²⁰. Notably, the Ebres papyrus had a dedicated section on eye diseases²¹, and amulets with protective decrees listed body parts to safeguard against a range of medical issues, including blindness²².

(2) Historical context of Disability in Greco Roman period

Ancient Greeks and Romans faced various illnesses and injuries that could result in disabilities²³. In their beliefs, disabled children were considered undesirable to the gods and were thought to be punished for misbehavior and sin²⁴. Unfortunately, some civilizations went to extreme measures, getting rid of deformed or disabled children, interpreting them as signs of

¹³ Veiga, P. (2009). *Health and Medicine in Ancient Egypt: Magic and Science*. Oxford: BAR International press.

¹⁴ David, R. (1999). *The Handbook to Life in Ancient Egypt*. Oxford: Oxford University Press. PP.1-443.

¹⁵ Ahmed M. Metwaly & Mohammed M. Ghoneim & Ibrahim.H. Eissa & Islam A. Elsehemy, et al. (2021). Traditional ancient Egyptian medicine: A review. *Saudi Journal of Biological Sciences*, 28(10). doi:10.1016/j.sjbs.2021.06.044.PP. 5823–5832.

¹⁶ BLODI, F. C. (1988). Blindness and the eye in mythology and religion as represented on postage stamps. *Documenta ophthalmologica*, 68(3-4), 401-421.

¹⁷ Heba Mahran & Samar Mostafa Kamal, Physical Disability in Old Kingdom Tomb Scenes. PP.169-192; Filler, A. G. (2007). A historical hypothesis of the first recorded neurosurgical operation: Isis, Osiris, Thoth, and the origin of the djed cross. *Neurosurg Focus*, 23(1). doi:10.3171/foc.2007.23.1.6, PP. 1-6.

¹⁸ Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593; Zucconi, L. M. (2007). Medicine and Religion in Ancient Egypt. *Religion Compass Journal*, 1(1), 26-37.

¹⁹ Allen, J. P. (2005). The Art of Medicine in Ancient Egypt. In J. P. Tucker, *The Art of Medicine in Ancient Egypt*. New York: Metropolitan Museum of Art. PP.9-12; Saleem, S. (2021). Egyptian Medical Civilization: from Dawn of History to Kasr Al Ainy School. *Pharmacy and Medicine in Ancient Egypt Journal*, 104–115.

²⁰ Scheidel, W. (2010). Age and Health in Roman Egypt. In C. Riggs, *The Oxford Handbook of Roman Egypt*. Oxford: Oxford University Press. doi:10.2139/ssrn.1551069. PP.1-12.

²¹ Ahmed M. Metwaly & Mohammed M. Ghoneim & Ibrahim.H. Eissa & Islam A. Elsehemy, et al. Traditional ancient Egyptian medicine. PP.5823–5832; Veiga, P. (2012). Some prevalent pathologies in ancient Egypt. *Hathor - Studies of Egyptology Journal*, 1, 73-83; Ali M Elhadi & Samuel Kalb & Luis Perez-Orribo, et al. (2012). The journey of discovering skull base anatomy in ancient Egypt and the special influence of Alexandria. *Neurosurg Focus Journal*, 33(2). doi:10.3171/2012.6. FOCUS12128. PP.1-13.

²² Pinch, G. (2010). *Magic in Ancient Egypt: Revised Edition* (2nd edition ed.). Texas: University of Texas Press; Allen, J. P. The Art of Medicine in Ancient Egypt. PP.9-12.

²³ Sneed, D. (2018). *The Life Cycle of Disability in Ancient Greece*. Los Angeles: UNIVERSITY OF CALIFORNIA. PP.1-340.

²⁴ Abulhul, Z. (2020). Treatment of Individuals with Disabilities throughout History and across Religions in Libya. *Open Journal of Social Sciences*, 8. doi:10.4236/jss.2020.811019. PP. 207-218

divine anger²⁵. In ancient Greek and Roman culture, disabled individuals were often treated with disdain, subjected to public mockery and humiliation²⁶, and sometimes reduced to being entertainment for others²⁷.

In ancient Rome, if a baby was born deformed, it faced a grim fate and was often killed²⁸. The society held a similar negative attitude towards disabled and deformed individuals, believing that the quality of one's soul was tied to the perfection of their body²⁹. This sentiment was expressed by *Lucio Anneo Seneca* in 41 A.D:

“We suffocate monstrous fetuses, and even our own children- if they have turned out disabled or abnormal – we drown them. However, this is not anger, it is reason that separates useless beings from the healthy”.

There is a notable contrast between the Greco-Roman world and their approach to disabilities acquired during a person's life. For instance, a soldier who returned home mutilated could receive treatment and even a basic form of social welfare, like occasional compensation for the inability to work³⁰. In ancient Greece, disabled men and women were engaged in various occupations, including agriculture, craft production, and education. Their society demonstrated a more inclusive attitude towards disabled individuals, allowing them to contribute actively to different areas of work and life³¹.

During his reign, Alexander the Great formed a new elite of disabled men and granted them positions of authority in the establishment of new cities like Alexandria and other settlements. This policy persisted during Hellenistic times, as disabilities were widespread, arising from warfare, occupation, aging, or being present from birth. Ancient medical texts from Egypt, Greece, and Rome offer insight into the attempts to treat specific disabilities using plant-based remedies for conditions such as paralysis, various eye disorders, and epilepsy. Additionally, evidence of disabilities can be found in mummies and various medical texts from Ptolemaic Egypt, providing further information about disability in that era³².

(3) Artistic Representation of various Disabilities in ancient Egypt

Indeed, physical disabilities were rarely depicted in ancient Egyptian art. Figures without arms were occasionally shown, but the artists rarely portrayed their kings or gods with actual disabilities or deformities³³. For example, human ear amulets symbolized the function of

²⁵ Heba Mahran & Samar Mostafa Kamal, Physical Disability in Old Kingdom Tomb Scenes. PP.169-192

²⁶ Draycott, J. (2015). RECONSTRUCTING THE LIVED EXPERIENCE OF DISABILITY IN ANTIQUITY: A CASE STUDY FROM ROMAN EGYPT. *Greece & Rome journal*, 62(2). doi: <https://doi.org/10.1017/S0017383515000066>, PP. 189 – 205; Létoublon, F. (2010). *To See or not to See: Blind People and Blindness in Ancient Greek Myth*. Pennsylvania: Lexington Books publishing.

²⁷ Abulhul, Z. Treatment of Individuals with Disabilities throughout History. PP. 207-218; Stiker, h.-j. (2019). *A History of Disability*. Michigan: University Michigan press.

²⁸ Fioranelli, M. Historical Evolution of Disability Concept. *History*. PP.1-9.

²⁹ Heba Mahran & Samar Mostafa Kamal. Physical Disability in Old Kingdom Tomb Scenes. PP.169-192.

³⁰ Fioranelli, M. Historical Evolution of Disability Concept. *History*. PP.1-9; C.F. Goodey & M. Lynn Rose. (2018). DISABILITY HISTORY AND GRAECO-ROMAN ANTIQUITY. In a. K. Michael Rembis & Catherine J. Kudlick, *The Oxford Handbook of Disability History*. Oxford: Oxford university press. PP.1-17.

³¹ Sneed, D. *The Life Cycle of Disability in Ancient Greece*. PP.1-340.

³² Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593; Černý, J. (1952). *Ancient Egyptian Religion*. Hutchinson: Hutchinson's University library books; Manfred, H. Disability and Rehabilitation in the Graeco-Roman World. PP. 1-9.

³³ El-Nadi, M. A. (2021). Armless Figures in Ancient Egypt Until the End of The New Kingdom. *SHEDET Journal*, 8(8). doi:10.21608/shedet.2021.207778. PP. 60-74.

providing hearing, but overall, the representation of disabilities in ancient Egyptian art was limited³⁴.

(3-1) Depiction of Blind people and Visual Impairment in ancient Egypt

In ancient Egypt, various remedies existed for different conditions, including blindness³⁵. Acquired blindness had multiple potential causes, apart from aging, such as occupational hazards, particularly for those working in dimly lit tombs. Other health conditions like diabetes could also lead to blindness³⁶. Additionally, war injuries often resulted in blindness, as archers deliberately aimed at the eyes of their adversaries³⁷.

The Egyptians and Greeks held contrasting beliefs about blindness³⁸. In Egyptian mythology, the eye, symbolized by the wedjat, represented protection and healing³⁹. Blindness was seen as an honorable war wound acquired during the battle between Good and Evil, rather than a punishment⁴⁰, unlike in Greek culture where it was considered a terrible fate to be avoided. Greeks associated blindness with special punishment for sins against a god⁴¹. In ancient Egypt, blindness was closely linked to the concept of darkness and seen as a life-threatening condition⁴². Congenital blindness and acquired blindness were perceived differently, with individuals being accommodated and integrated into Egyptian society⁴³.

The *Wdjat* Eyes symbolized permanent protection for the deceased in Egyptian mythology⁴⁴. Khonsu was implored for curing blindness⁴⁵, and Hathor's myth of The Contending of Horus and Seth involved her restoring Horus' sight with her milk⁴⁶. Temples did not allow commoners to enter, except for the blind⁴⁷. Blindness, a common disability in antiquity, was referred to in various texts⁴⁸, like the stela Turin 50052, which discussed

³⁴ Sneed, D. *The Life Cycle of Disability in Ancient Greece*. PP.1-340; Giovanni Ruffini & W. V. Harris. (2004). *Ancient Alexandria between Egypt and Greece* (Vol. 26). Leiden: Columbia Studies in the Classical Tradition- Brill; A. TILLINGHAST, J. (1902). THE SOCIAL STATUS OF THE DEAF IN THE PAST—IV. *American Annals of the Deaf*, 47(2), 147-156.

³⁵ Zimmerman, M. R. (2017). Practicing Medicine in Ancient Egypt. *Juniata Voices*, 17, 144-152.

³⁶ Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593.

³⁷ Manfred, H. Disability and Rehabilitation in the Graeco-Roman World. PP. 1-9; Colledge, S. L. (2015). *The process of cursing in ancient Egypt*. Liverpool: University of Liverpool; Bierbrier, M. L. (2008). *Historical Dictionary of Ancient Egypt*. Lanham: Scarecrow Press.

³⁸ Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593.

³⁹ Zimmerman, M. R. Practicing Medicine in Ancient Egypt. PP.144-152.

⁴⁰ Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593.

⁴¹ David, R. *The Handbook to Life in Ancient Egypt*. PP.1-443; Alston, R. (1998). *Soldier and Society in Roman Egypt a Social History*. Abingdon: Routledge; Lichtheim, M. (2006). *Ancient Egyptian Literature, Volume I: The Old and Middle Kingdoms* (First Edition ed.). California: University of California Press.

⁴² YOO, S. H. (2012). *PATTERNS OF ANCIENT EGYPTIAN CHILD DEITIES*. Rhode Island: BROWN UNIVERSITY. PP.1-276.

⁴³ Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593;

حسن كمال. (١٩٩٨). *الطب المصري القديم* (الإصدار الثالثة). القاهرة: الهيئة المصرية العامة للكتاب. ص ٣٤٤-١.

⁴⁴ Hosny, M. A. (2020). Light, Darkness and Shadow in ancient Egypt. *Journal of Association of Arab Universities for Tourism and Hospitality*, 18(3), 35-49.

⁴⁵ YOO, S. H. *PATTERNS OF ANCIENT EGYPTIAN CHILD DEITIES*. PP.1-276.

⁴⁶ Blomstedt, P. (2014). Orthopedic surgery in ancient Egypt. *Acta Orthop*, 85(6), doi:10.3109/17453674.2014.950468. PP. 670-676; T. L.DUPRAS & L. J.WILLIAMS & M. DE MEYER, et al. (2010). Evidence of Amputation as Medical Treatment in Ancient Egypt. *International Journal of Osteoarchaeology*, 20(4). doi: https://doi.org/10.1002/oa.1061. PP. 405-423; Graves-Brown, C. (2010). *Dancing for Hathor: Women in Ancient Egypt*. Houston: Continuum.

⁴⁷ Ruiz, A. (2001). *The Spirit of Ancient Egypt*. New York: Algora Publishing; Černý, J. *Ancient Egyptian Religion*. PP. 1-9.

⁴⁸ Manfred, H. Disability and Rehabilitation in the Graeco-Roman World. PP. 1-9.

physical or spiritual blindness⁴⁹. The Amun ostracon, written in Demotic script, told the story of a blind man calling upon the god Amun to restore his sight (**Fig.1**). Blind musicians, particularly harpists⁵⁰, were frequently depicted in Egyptian art due to their enhanced memory for song lyrics⁵¹. Additionally, Coffin Texts 157 associated the pig with reduced eyesight⁵². The blind was highly regarded as singers, and the best school for female singers was located in Memphis⁵³ (**Fig. 2-3**).

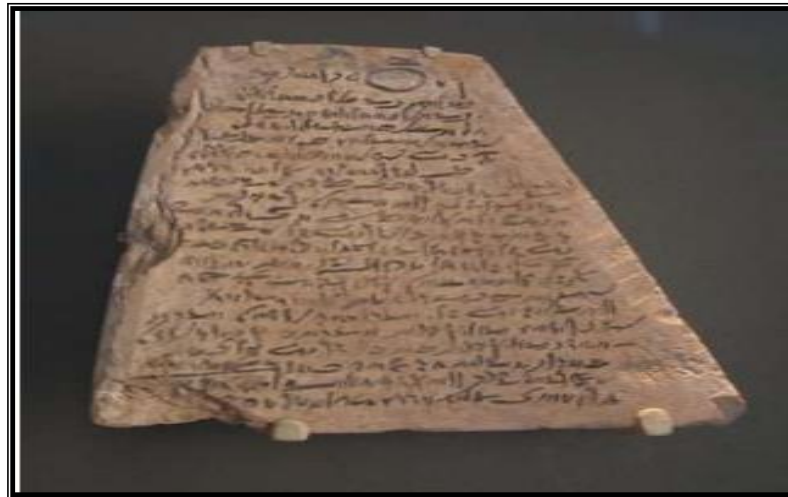


Fig.1. Ostracon with prayer to Amun, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593).



Fig.2. Blind singers, Tell el-Amarna, Erman, A. (1971). *Life in Ancient Egypt*. (H. M. Tirard, Trans.) Franklin Ave, Garden City: Dover Publications).

⁴⁹ YOO, S. H. *PATTERNS OF ANCIENT EGYPTIAN CHILD DEITIES*. PP.1-276.

⁵⁰ Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593.

⁵¹ Brier, B. (1999). *Daily Life of the Ancient Egyptians*. Boston: Greenwood Publishing Group Inc; Dixon-Kennedy, M. (1998). *Encyclopedia of Greco-Roman Mythology*. California: ABC-CLIO.

⁵² Veiga, P. (2012). Some prevalent pathologies in ancient Egypt. PP.73-83.

⁵³ Erman, A. (1971). *Life in Ancient Egypt*. (H. M. Tirard, Trans.) Franklin Ave, Garden City: Dover Publications; Kamil, J. (1983). *Luxor: A Guide to Ancient Thebes*. Boston: Addison-Wesley Longman Ltd.



Fig.3. Th two blind musicians are playing intricately decorated harps for a group of gods, Ramses III's tomb, the tomb became known as the Harpers' tomb, (d'Avennes, E. P. (2008). *Atlas of Egyptian Art*. Cairo: Zeitouna Press; Remler, P. (2010). *Egyptian Mythology A to Z* (3rd edition ed.). Gastonia, North Carolina: Chelsea House Publications; Draycott, J. RECONSTRUCTING THE LIVED EXPERIENCE OF DISABILITY IN ANTIQUITY. PP. 189 – 205).

The blind through Greco Roman period, despite not being able to see the present, are thought to be capable of seeing the future⁵⁴. The eye of Horus known as a *wedjat/udjat/wadjet* and reproduced as amulets continued to be produced throughout the Ptolemaic period to protect both the living and the dead⁵⁵ (**Fig.4**).



Fig.4. *Wedjats* (Eye of Horus), (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593).

⁵⁴Fioranelli, M. Historical Evolution of Disability Concept. *History*. PP.1-9; C.F. Goodey & M. Lynn Rose. *DISABILITY HISTORY AND GRAECO-ROMAN ANTIQUITY*. PP. 1-17.

⁵⁵ Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593.

The Fayum mummy portrait is of a young man, who his right eye seems to show signs of a possible disability that has been treated. His right eye is missing eye lashes, while his left eye still has them⁵⁶. This surgery might have been performed to improve the vision in that eye or to repair a traumatic lesion⁵⁷ (**Fig.5**) that indicates the ancient Egyptians were renowned for their medical expertise⁵⁸.



Fig.5. Fayum Mummy Portrait, young man with surgical scar, Roman period, encaustic paint on wood, (Allen, J. P. *The Art of Medicine in Ancient Egypt*. pp. 9-12; Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593).

(3-2) Depiction of Limb Amputation, Back Deformities, Paralyzed, leg Deformities and Armless in ancient Egypt

Ancient Egyptians had well-described treatments for fractures and dislocations⁵⁹, and they also used amputation as a medical treatment⁶⁰. They believed in the power of speech on life and afterlife, so they restored limbs and organs to the deceased using symbolic forms⁶¹. Roman physicians of the first century AD also described amputation⁶², and a wall relief on the temple of Kom Ombo depicted instruments, possibly representing Greek or Roman surgical tools⁶³ (**Fig.6**).

⁵⁶ Ibid, pp.1-593.

⁵⁷ Allen, J. P. *The Art of Medicine in Ancient Egypt*. pp. 9-12.

⁵⁸ Carmelo Messina & Said Mahmoud Abd El-Moneim & Massimiliana Pozzi, et al. (2022). Evidence of possible lower limb amputation in a tomb in an ancient Egyptian necropolis: the case report of an on-site radiographic analysis. *BJR Case Reports Journal*, 8(6). doi:10.1259/bjrcr.20220090. PP. 1-4.

⁵⁹ Zimmerman, M. R. *Practicing Medicine in Ancient Egypt*, 144-152.

⁶⁰ Heba Mahran & Samar Mostafa Kamal. Physical Disability in Old Kingdom Tomb Scenes. PP.169-192; Hasan, N. A.-G. (2017). Medicine in ancient Egypt. *The Egyptian Journal of Internal Medicine*, 29(1). doi: 10.4103/ejim.ejim_23_17. PP. 33-34; Blomstedt, P. (2014). Orthopedic surgery in ancient Egypt. *Acta Orthop*, 85(6). doi:10.3109/17453674.2014.950468, PP. 670-676.

⁶¹ Colazilli, A. (2012). Reproducing human limbs. Prosthesis, amulets and votive objects in Ancient Egypt. *RES ANTIQUITATIS Journal*, 3(6), 147-174.

⁶² Heba Mahran & Samar Mostafa Kamal. Physical Disability in Old Kingdom Tomb Scenes. PP.169-192.

⁶³ Zimmerman, M. R. *Practicing Medicine in Ancient Egypt*, 144-152; Dupras, Tosha & Williams, Lana & De Meyer, Marleen, et al. (2009). Evidence of Amputation as Medical Treatment in Ancient Egypt. *International Journal of Osteoarchaeology*, 20. doi:10.1002/oa.1061. PP. 405-423; Carmelo Messina & Said Mahmoud Abd El-Moneim & Massimiliana Pozzi, et al. Evidence of possible lower limb amputation in a tomb in an ancient Egyptian necropolis: PP.1-4.

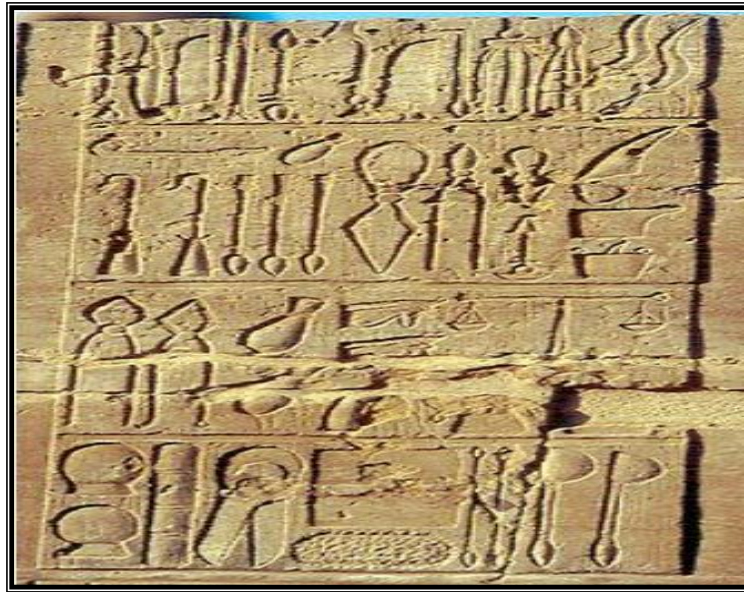


Fig.6. Medical instruments depicted on wall of temple at Kom Ombo, Ptolemaic period, (Zimmerman, M. R. *Practicing Medicine in Ancient Egypt*, 144-152).

Ancient Egyptian art often showcased medical conditions like spinal deformities⁶⁴. Armless human figures were first seen during the Predynastic period and served as guardians during the funerary journey. These armless figures represented deceased ancestors who were believed to bless and accompany the departed on their journey in the afterlife⁶⁵ (**Fig.7**).



Fig.7. Female serving figures, late Naqada II, (El-Nadi, M. A. *Armless Figures in Ancient Egypt Until the End of The New Kingdom*. PP.60-74).

⁶⁴ Lloyd, A. B. (2010). *A Companion to Ancient Egypt*. Hoboken, New Jersey: Blackwell Publishing Ltd; Draycott, J. (2015). RECONSTRUCTING THE LIVED EXPERIENCE OF DISABILITY IN ANTIQUITY: A CASE STUDY FROM ROMAN EGYPT. *Greece & Rome journal*, 62(2), doi: <https://doi.org/10.1017/S0017383515000066>, PP. 189 - 205.

⁶⁵ El-Nadi, M. A. *Armless Figures in Ancient Egypt Until the End of The New Kingdom*. PP.60-74.

Currently, there are plenty of statues, reliefs, records, drawings found from ancient Egypt represented people with disabilities such as body deformities and physical deformities of the movement system (**Fig.8**). Also, they were given special equipment, e.g. sticks, canes, and crutches for better locomotion⁶⁶ (**Fig.9**).



Fig.8. The hunchback from the household of *Mitry*, Dynasty VI, (Cody, M. E. (2004). *Egyptian Art: Selected Writings of Bernard V. Bothmer*. Oxford: Oxford University Press).



Fig.9. *Nikauisesi*, a tomb owner with a deformity in his left leg and he was relied on a stick because he had poliomyelitis in his tomb, 6th Dynasty, Saqqara, (Heba Mahran & Samar Mostafa Kamal. *Physical Disability in Old Kingdom Tomb Scenes*, PP.169-192).

⁶⁶ WS, E. (2018). Equipment and facilities adapted for disabled people in recreation and sport. *MOJ Applied Bionics and Biomechanics*, 2(1). doi:10.15406/mojabb.2018.02.00038. PP. 9-13; Klaus O Fritsch & Heshem Hamoud & Adel H Allam & Alexander Grossmann, et. al. (2015). The orthopedic diseases of ancient Egypt. *Anat Rec (Hoboken)*, 298(6), 1036-1046. doi:10.1002/ar.23136.

Ancient Egyptians believed in the reassembling of body parts for a successful rebirth in the afterlife. Evidence suggests that polio was a prevalent disease in ancient Egypt, and cerebral palsy might have been common too. Tutankhamun's disability is depicted in his tomb through various artworks, showing him with canes or walking sticks, sitting, and being supported by gods or his wife.⁶⁷ (Fig.10).



Fig.10. Reconstruction of a disabled Tutankhamun as reconstructed, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593).

In Greek mythology, Hephaestus “Vulcan “is considered a «handicapped» god because he was «shriveled of foot» thereof, he was cast out from Olympus by his own parents, Hera and Zeus⁶⁸ (Fig.11).



Fig.11. Statue of Hephaestus “Vulcan “, 1st century A.D, Roman period, (MARTINS, P. R. *THE REPRESENTATION OF DISABILITY IN DGPC MUSEUMS COLLECTIONS*, PP.13-33.

⁶⁷ Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593; Francesco M. Galassi & Michael E. Habicht and Frank J.Ruhli. (2016). Poliomyelitis in Ancient Egypt? *Neurological Sciences*, 38(2). doi:10.1007/s10072-016-2720-9. PP. 375.

⁶⁸ MARTINS, P. R. (2018). THE REPRESENTATION OF DISABILITY IN DGPC MUSEUMS COLLECTIONS: DISCOURSE, IDENTITIES AND SENSE OF BELONGING. *Repositório Institucional da Universidade de Évora*, 13-33.

There were numerous artistic depictions of disabled people in Egyptian art⁶⁹ (Fig.12-13).



Fig.12. Ivory nude man had a kyphotic spine curvature and Pott's disease, Ptolemaic and Hellenistic period, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593; (حسن كمال . الطب المصرى القديم . ص ٣٤٤-١).



Fig.13. Man, with Kyphotic spinal curvature. Hellenistic Roman period, 1st century A.D., Terracotta, British Museum, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593).

⁶⁹ Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593

In the Ptolemaic and Roman periods, the artificial prostheses were realized by shaping the linen into hands and feet with the aid of resin to confer more resistance to the textiles⁷⁰ (Fig.14-15).



Fig.14. Female mummy with arm Prosthesis, Durham oriental museum, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt.pp.1-593*).



Fig.15. Votive offering depicting a man and a child with a walking stick, Hellenistic-Roman imperial period, 1st century B.C, Marble, British museum, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt.pp.1-593*).

⁷⁰ Sneed, D. *The Life Cycle of Disability in Ancient Greece*. PP. 1-340.

In the meantime, during the Greek Roman times, *EX Votos* in shape of human limbs were reproduced and presented to the gods in return for health or to give thanks for a restored limb⁷¹ (Fig.16-17). During ancient times, people offered votive offerings to gods as part of a healing ritual, seeking cures for afflictions. For example, statues of Imhotep and Asclepius, and even left foot carvings made of limestone, were commonly used as votive offerings in this context.⁷²



Fig. 16. The Egyptian Museum houses a marble votive foot featuring two snakes with human heads representing Isis and Serapis on the front, while the back depicts Harpocrates in human form, (Colazilli, A. *Reproducing human limbs. Prosthesis, amulets and votive objects in Ancient Egypt*, PP.147-174).

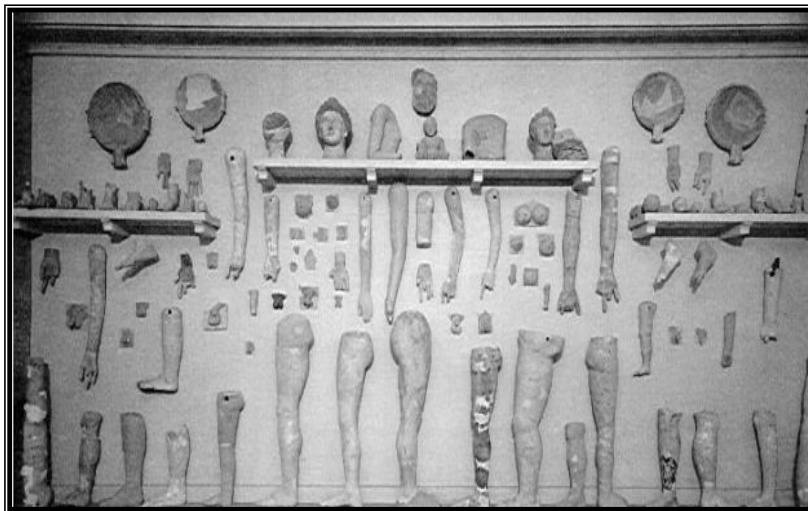


Fig.17. Terracotta anatomical votive dedications from the sanctuary of Asklepios at Corinth, (Sneed, D. *The Life Cycle of Disability in Ancient Greece*. PP. 1-340).

The most well-known example of someone with cerebral palsy who is depicted artistically is the god Harpocrates⁷³ (Fig.18-19).

⁷¹ Colazilli, A. *Reproducing human limbs. Prosthesis, amulets and votive objects in Ancient Egypt*, PP.147-174.

⁷² Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593; Scheidel, W. *Age and Health in Roman Egypt*. pp. 1-12.

⁷³ Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593.







Fig.18. Child with a walker had cerebral palsy or polio, later Ptolemaic period, British museum, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593).



Fig.19. Harpocrates depicted bent at the knee, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593).

(3-3) Depiction of Dwarfism in ancient Egypt

It seems, three Egyptian words for abnormally short people were known as dng , nmw  and Hwa  ⁷⁴. Also, a determinative or a symbol represented a dwarf with short limbs and a normal trunk usually accompanies these words ⁷⁵ . also, Bes name probably from the word *besa* that means “to protect” ⁷⁶.

Additionally, dwarfs were accepted in ancient Egypt and their disorder was not shown as a physical handicap ⁷⁷ as well as the ancient Egyptians often documented the presence of dwarfs in every aspect of life ⁷⁸. The earliest evidence of dwarfism in ancient Egypt can be traced back to the Badarian period during the Predynastic era ⁷⁹. Unlike some other ancient societies,

⁷⁴ Baki, M. A.-F. (2021). Egyptian Dwarf Deities Associated with Solar Cult in Ancient Egypt. *Journal of Association of Arab Universities for Tourism and Hospitality*, 20(4), 159-188.

⁷⁵ Kozma, C. (2006). Dwarfs in ancient Egypt. *The American Journal of Medical Genetics - Part A (AJMG)*, 140 A (4), 303-311.

⁷⁶ Baki, M. A.-F. Egyptian Dwarf Deities Associated with Solar Cult in Ancient Egypt. *PP*.159-188.

⁷⁷ Kozma, C. Dwarfs in ancient Egypt. *PP*. 303-311.

⁷⁸ Heba Mahran & Samar Mostafa Kamal. Physical Disability in Old Kingdom Tomb Scenes. *PP*. 169-192.

⁷⁹ Kozma, C. Dwarfs in ancient Egypt. *PP*. 303-311.

ancient Egyptians did not overtly discriminate against individuals with dwarfism⁸⁰. Historical records indicate that the first pygmy was brought from Punt during the reign of King Asosi in the 5th Dynasty⁸¹. Wisdom writings and moral teachings in ancient Egypt emphasized respect for dwarfs and people with disabilities. Interestingly, the medical papyri from ancient Egypt did not mention dwarfism, suggesting that they likely did not view it as a disorder or disease⁸².

During the Old Kingdom period, numerous high-ranking dwarfs held esteemed positions in Egyptian society, which is evident from their elaborate and expensive tombs located in the royal cemeteries. These burial sites also highlight their close connection to the king⁸³ (**Fig.20**). Also, Bes was a guardian of mothers during childbirth⁸⁴. Ancient Egyptians believed that the god Bes, who was depicted as a bandy-legged dwarf, served as a protector of women during childbirth⁸⁵. Therefore, guardian deities such as Bes, the dwarflike protector of mothers and infants, were popular⁸⁶. For example, in a magical papyrus at Leiden, there is a spell to facilitate birth, called “the spell of the dwarf”: “O good dwarf, come, because of the one who sent you...come down placenta, come down placenta, come down!”⁸⁷. Therefore, Bes served as protector of the home and especially of women and infants⁸⁸.



Fig.20. Seneb director of dwarfs and his wife Senet Tefes, Dynasty VI, (David, R. *The Handbook to Life in Ancient Egypt*. PP.1-443; Cody, M. E. *Egyptian Art: Selected Writings of Bernard V. Bothmer*. PP. 1-515.

In the meantime, people with dwarfism had religious and magical significance outside the form of gods⁸⁹. Also, the dwarfs' function was for the protection of the living and the dead from dangers facing them such as diseases that involved magical practices to protect the living and the dead⁹⁰. So, statues of common people with dwarfism were placing in tombs is a testament to the ritualistic importance of individuals with dwarfism to accompany the deceased to the afterlife⁹¹.

⁸⁰ Engele, K. (2020). Skeletal Dysplasia: An Analysis of Dwarfism in Ancient Egyptian Culture. *University of Saskatchewan Archaeology and Anthropology Graduate student Journal*, 1(1), 57–65.

⁸¹ Baki, M. A.-F. Egyptian Dwarf Deities Associated with Solar Cult in Ancient Egypt, PP.159-188.

⁸² Kozma, C. Dwarfs in ancient Egypt. PP. 303-311.

⁸³ Heba Mahran & Samar Mostafa Kamal. Physical Disability in Old Kingdom Tomb Scenes. PP. 169-192.

⁸⁴ Bard, K. A. (1999). *Encyclopedia of the Archaeology of Ancient Egypt* (1st edition ed.). Milton Park, Abingdon: Routledge.

⁸⁵ Bard, K. A. (1999). *Encyclopedia of the Archaeology of Ancient Egypt* (1st edition ed.). Milton Park, Abingdon: Routledge.

⁸⁶ Roger S. Bagnall & Dominic W. Rathbone. (2017). *Egypt from Alexander to the Copts: An Archaeological and Historical Guide*. Cairo: The American University in Cairo Press.

⁸⁷ Kozma, C. Dwarfs in ancient Egypt. PP. 303-311.

⁸⁸ Allen, J. P. The Art of Medicine in Ancient Egypt. pp. 9-12.

⁸⁹ Engele, K. (2020). Skeletal Dysplasia: An Analysis of Dwarfism in Ancient Egyptian Culture, PP. 57–65.

⁹⁰ Kozma, C. Dwarfs in ancient Egypt. PP. 303-311.

⁹¹ Engele, K. (2020). Skeletal Dysplasia: An Analysis of Dwarfism in Ancient Egyptian Culture, PP. 57–65.

Dwarfs in ancient Egypt were believed to possess magical powers, leading to a high demand for amulets depicting diversity-preventing dwarfs or the dwarf-god Bes, especially for protection. The figures of bow-legged dwarfs were also popular for similar reasons⁹². In ancient Egypt, people acquired dwarf amulets from the Hathor temple at Dendera to seek the protection of the goddess and her helpers, taking these amulets home with them⁹³ (**Fig.21-22**). Additionally, elite dwarfs from the Old Kingdom enjoyed significant status and were buried in important locations near the pyramids in the royal cemetery⁹⁴.

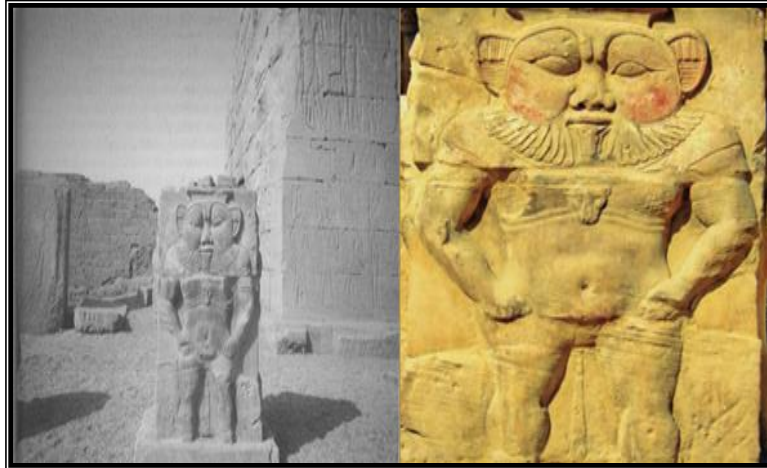


Fig.21. Block with relief showing Bes in the forecourt of the temple of Hathor at Dendera, 1st century B.C-1st century AD. Such images were placed in the outer areas of temples to act as magical defenders, (Remler, P. *Egyptian Mythology A to Z*. PP. 1-232).



Fig.22.Freestanding limestone stela with a row of Bes figures. Such stelae were used to protect a building or a whole area from supernatural dangers, (Pinch, G. *Magic in Ancient Egypt*. PP.1-192).

⁹² Aterman, K. (1999). From Horus the child to Hephaestus who limps: A romp through history. *American Journal of Medical Genetics*, 83(1). doi: [https://doi.org/10.1002/\(SICI\)1096-8628\(19990305\)83:1<53: AID-AJMG10>3.0.CO;2-K](https://doi.org/10.1002/(SICI)1096-8628(19990305)83:1<53: AID-AJMG10>3.0.CO;2-K). PP. 53-63.

⁹³ Pinch, G. *Magic in Ancient Egypt*. PP. 1-192.

⁹⁴ Kozma, C. Dwarfs in ancient Egypt. PP. 303-311.

Specifically, the dwarfs played roles in government offices and in festival rites⁹⁵ as well as Bes was thought that bring good luck to newly married couples⁹⁶ also dwarfs were employed as personal attendants, overseers of linen, animal tenders, jewelers, dancers, and entertainers⁹⁷ (**Fig.23-24**). So, the queen and royal women, accompanied by musicians and dwarfs, danced and sang to the god and to the ruler⁹⁸. In addition, Bes danced and played the lute for the merriment of the gods⁹⁹ (**Fig.25-26**).

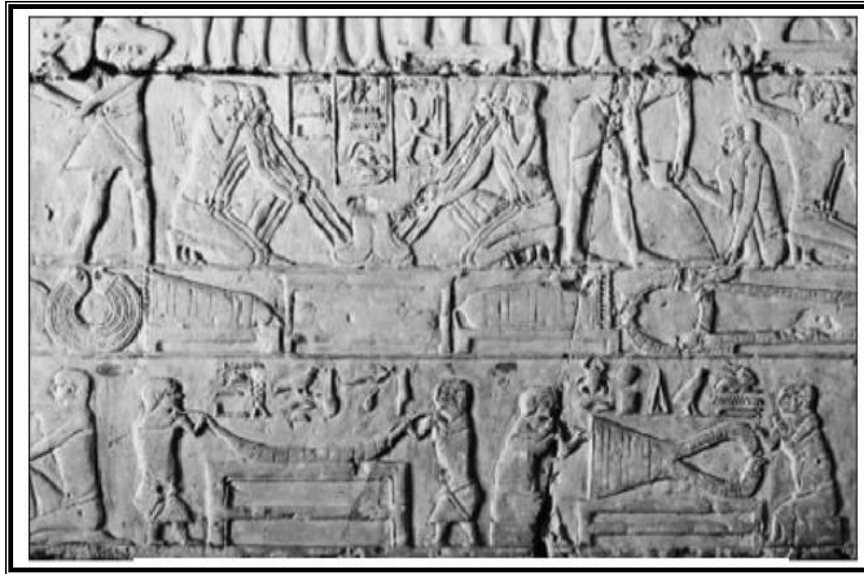


Fig.23.Dwarfs working as goldsmiths, tomb of Mereuka at Saqqara, (Heba Mahran & Samar Mostafa Kamal. *Physical Disability in Old Kingdom Tomb Scenes*, PP. 169-192).



Fig.24.Dwarfs jewelers, tomb of Mereuka, Saqqara, Egypt, (Kozma, C. *Dwarfs in ancient Egypt*. PP. 303-311).

⁹⁵ Bunson, M. R. (2002). *Encyclopedia of ancient Egypt*. New York: Facts on File, Inc. PP. 1-481.

⁹⁶ Ruiz, A. (2001). *The Spirit of Ancient Egypt*. PP.1-288.

⁹⁷ Kozma, C. *Dwarfs in ancient Egypt*. PP. 303-311.

⁹⁸ Bunson, M. R. *Encyclopedia of ancient Egypt*. PP. 1-481.

⁹⁹ Černý, J. *Ancient Egyptian Religion*. PP. 1-159.

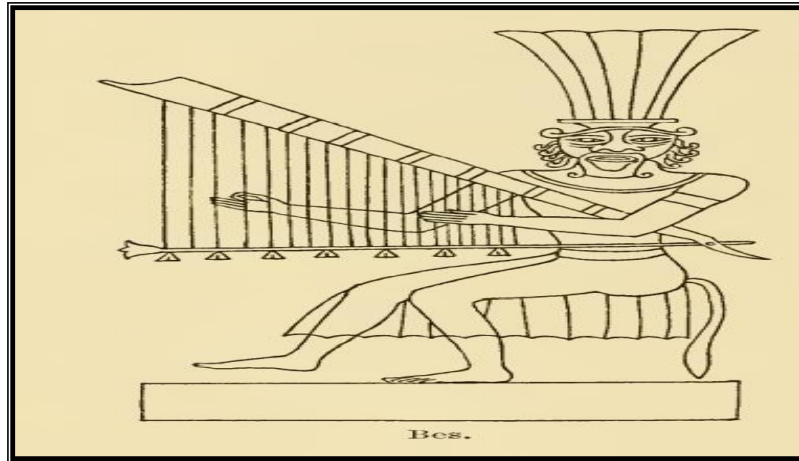


Fig.25.Bes god playing upon a harp, (Budge, E. A. (1969). *The Gods of the Egyptians or Studies in Egyptian Mythology*. New York: Dover Publications).

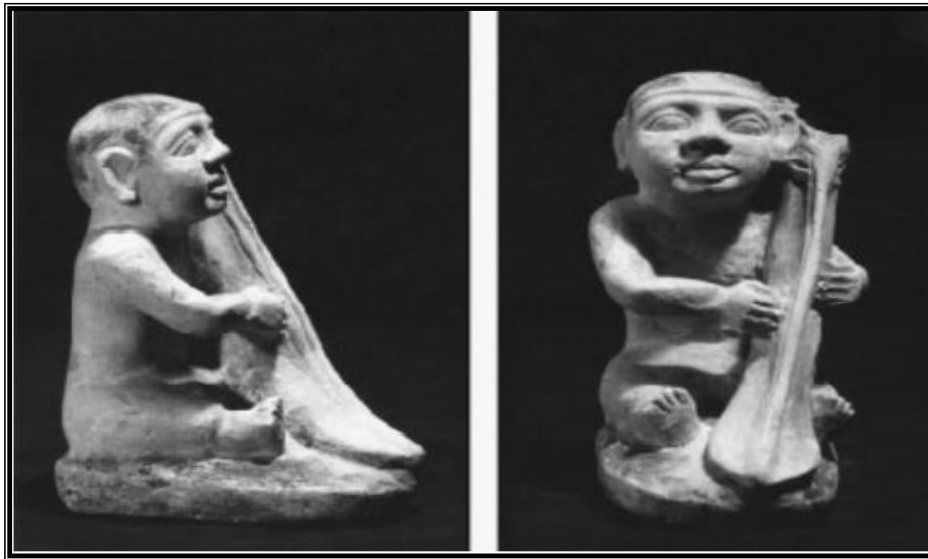


Fig.26.Dwarf playing the harp, courtesy of the oriental institute, Chicago, USA, (Kozma, C. Dwarfs in ancient Egypt. *PP.* 303-311).

Ancient Egypt had numerous dwarf gods who were revered for their involvement in magical practices, safeguarding both the living and the deceased¹⁰⁰. Dwarfs were also employed in metalworking¹⁰¹. The god Bes, in particular, was known to protect against malevolent deities and hostile spirits of the dead¹⁰². Bes was associated with various transitional or chaotic aspects, including sleep, warfare, protection of the dead, and joyful celebrations of music, dance, and wine¹⁰³. Their names and titles were inscribed on funerary statues or reliefs¹⁰⁴. Bes was closely linked to other deities like Hathor and Taweret, who were regarded as family goddesses¹⁰⁵. The worship of dwarfish gods, such as Ptah and Bes, spread widely throughout

¹⁰⁰ Heba Mahran & Samar Mostafa Kamal. Physical Disability in Old Kingdom Tomb Scenes. *PP.* 169-192.

¹⁰¹ Ruiz, A. *The Spirit of Ancient Egypt*. *PP.* 1-288.

¹⁰² Allen, J. P. *The Art of Medicine in Ancient Egypt*. pp. 9-12.

¹⁰³ David, R. *The Handbook to Life in Ancient Egypt*. *PP.* 1-443.

¹⁰⁴ Kozma, C. Dwarfs in ancient Egypt. *PP.* 303-311.

¹⁰⁵ David, R. *The Handbook to Life in Ancient Egypt*. *PP.* 1-443.

the ancient Mediterranean¹⁰⁶. *Amenemope's* instructions emphasized respect for dwarfs and individuals with handicapping conditions, advising against mocking a blind man, teasing a dwarf, or interfering with a cripple's condition¹⁰⁷.

In the meantime, the dwarfs became much popular in Graeco-Roman Egypt¹⁰⁸ also some depictions of those with disabilities for instance dwarfism seem to increase during the Ptolemaic times¹⁰⁹ (Fig.27-28). In Archaic and Classical Greece, dwarfs did not hold the elevated status that they had in Egypt¹¹⁰. The most well-known dwarf gods during this period were Bes and a miniature figure of the god Ptah, also known as the Greek Pataikos¹¹¹



Fig.27. Actor and dwarfism, Hellenistic period, 1st century B.C, Terracotta, British Museum, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt.pp.1-593.*).



Fig.28. Lamp with people with dwarfism, Hellenistic period, 1st century B.C, Pottery, British museum, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt.pp.1-593.*).

¹⁰⁶ STONER, L. B. (2015). A Bronze Hellenistic Dwarf in the Metropolitan Museum. *METROPOLITAN MUSEUM JOURNAL*, 50, 94-101.

¹⁰⁷ Kozma, C. Dwarfs in ancient Egypt. *PP.* 303-311.

¹⁰⁸ Mariam Said & Noha Shalaby. (2019). Recreation in Graeco-Roman Egypt. *International Academic Journal Faculty of Tourism and Hotel Management*, 5(1), 76-106.

¹⁰⁹ Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt.pp.1-593.*

¹¹⁰ STONER, L. B. A Bronze Hellenistic Dwarf in the Metropolitan Museum. 94-101.

¹¹¹ Heba Mahran & Samar Mostafa Kamal. Physical Disability in Old Kingdom Tomb Scenes. *PP.* 169-192.

Besides, Bes god was considered as protector god of childbirth, sexuality, children and women. Also, he was a favored deity particularly through the Greco-Roman times¹¹². In addition, Bes often painted his image in their houses to bring good luck and well-being¹¹³. Meanwhile, dwarfism was a noticeable feature in representing minor figures at work manufacturing jewelry, carrying objects, taking care of pets or even just following their masters¹¹⁴. The practice of keeping dwarfs for amusement is rooted in the ancient Pharaonic tradition, but it evolved with a distinctive Greek influence¹¹⁵. Dwarfs came to be associated with the image of buffoons and entertainers, a perception that extended across the Roman world¹¹⁶. During the Roman period, dwarfs became closely linked to Egyptian culture, even more so than in Classical Greece¹¹⁷ (**Fig.29-30**).



Fig.29. Terracotta figure of the god Bes, represented here as a Roman soldier, (David, R. *The Handbook to Life in Ancient Egypt*. PP. 1-443)



Fig.30. Bes statue. Late Hellenistic – early Roman period, 1st century B.C- 1st century C.E, Terracotta, Metropolitan Museum, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593.).

¹¹² Kozma, C. Dwarfs in ancient Egypt. PP. 303-311.

¹¹³ Remler, P. *Egyptian Mythology A to Z* (3rd edition ed.). PP. 1-232.

¹¹⁴ Heba Mahran & Samar Mostafa Kamal. Physical Disability in Old Kingdom Tomb Scenes. PP. 169-192.

¹¹⁵ STONER, L. B.A Bronze Hellenistic Dwarf in the Metropolitan Museum, 94-101.

¹¹⁶ Aterman, K. From Horus the child to Hephaestus who limps: A romp through history. 53-63.

¹¹⁷ STONER, L. B.A Bronze Hellenistic Dwarf in the Metropolitan Museum, 94-101; YOO, S. H. *PATTERNS OF ANCIENT EGYPTIAN CHILD DEITIES*. PP. 1-276.

In the meantime, there are countless artistic representations of individuals with dwarfism from ancient Egypt, ranging from regular people to gods until the Greco–Roman Period¹¹⁸. Ancient Egyptian art frequently depicted dwarfs¹¹⁹, and their images were also common in the arts of New Kingdom Egypt and Classical Greece¹²⁰. During the Hellenistic and Ptolemaic periods, dwarfs were shown as workers, servants, dancers, actors, and others from the working classes (**Fig.31**). Representations of women with disabilities were scarce in both Greek and Egyptian art, possibly due to the negative effects that certain conditions, like dwarfism, could have on childbirth and survivability¹²¹ (**Fig. 32-34**).

In Roman culture, images of dwarfs became part of the "Egyptianizing" style that was adopted¹²². Bes 𓆎𓆏𓆑, the dwarf god, was portrayed in various roles such as a musician, a sword-wielding warrior, or a symbol of destructive forces, often holding two knives¹²³. These grotesque features and the magical knife were intended to ward off evil and protect the families he watched over¹²⁴ (**Fig.35**).



Fig.31. Dancing Bes alongside seated group of Musicians, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593).

¹¹⁸ Engele, K. Skeletal Dysplasia: An Analysis of Dwarfism in Ancient Egyptian Culture. 57–65; Zakrzewski, S. R. Palaeopathology, disability and bodily impairments. pp. 57-68; Hassaan, G. A. (2020). Mechanical Engineering in Ancient Egypt, Part 92: Tomb Inscription During the Old Kingdom. *Scientific Review Journal*, 6(8). doi:10.32861/sr.68.79.93. PP. 79-93; Teeter, E. (2003). *Ancient Egypt: Treasures from the Collection of the Oriental Institute*. Chicago: Oriental Institute of the University of Chicago; Patricia Roque Martins & Amanda Robledo, et al. (2018). *REPRESENTING DISABILITY IN MUSEUMS IMAGINARY AND IDENTITIES*. Porto: CITCEM – Centro de Investigação Transdisciplinar Cultura, Espaço e Memória. doi:10.21747/9789898970114/repr.

¹¹⁹ David, R. *The Handbook to Life in Ancient Egypt*. PP. 1-443.

¹²⁰ STONER, L. B. (2015). A Bronze Hellenistic Dwarf in the Metropolitan Museum. 94-101.

¹²¹ Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593.

¹²² STONER, L. B. (2015). A Bronze Hellenistic Dwarf in the Metropolitan Museum. 94-101.

¹²³ Aterman, K. From Horus the child to Hephaestus who limps: A romp through history. PP. 53-63.

¹²⁴ David, R. *The Handbook to Life in Ancient Egypt*. PP. 1-443.



Fig.32. Female dwarf dancer, Terracotta, Alexandria, (Giovanni Ruffini & W. V. Harris. *Ancient Alexandria between Egypt and Greece*. PP. 1-295).



Fig.33. Beset appears on the reverse of a Bes figure and she has long, layered hair, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593).



Fig.34. Women with dwarfism dancing, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593).



Fig.35. Images of the changing functions of Bes “demons”, showing Bes as musicians or as a sword carrying warrior, (Aterman, K. From Horus the child to Hephaestus who limps. PP. 53-63).

Dwarfism was linked to various disabilities, including short hands, Lordosis, Kyphosis, achondroplasia, among others¹²⁵. In the Hellenistic world, depictions of dwarfs combined realism with exaggeratedly large features, extending to the soles of their feet¹²⁶ (**Fig.36**). During Greco-Roman times, Bes was represented with a fierce look, wielding knives and swords, indicating his role as a protector god extended to combating evils, even in warfare¹²⁷ (**Fig.37**). additionally, Bes, is depicted as a grimacing, bearded dwarf, sometimes naked and squatting, or crowned with feathers¹²⁸. Further, during the Ptolemaic times Bes was merged wholly in Horus with body and wings of a hawk united to the body of a vigorous young man¹²⁹.



Fig.36. A painted statue of limestone of the God Bes, the god of love, childbirth, and sexuality in ancient Egypt, 30th dynasty reign of Nectanebo II. Bes is portrayed with hybrid features and sticking out his tongue. He wears a monkey skin on his back. The Louvre Museum, Paris, (Kozma, C. Dwarfs in ancient Egypt. PP. 303-311).

¹²⁵ Heba Mahran & Samar Mostafa Kamal. Physical Disability in Old Kingdom Tomb Scenes. 169-192.

¹²⁶ STONER, L. B. (2015). A Bronze Hellenistic Dwarf in the Metropolitan Museum. 94-101.

¹²⁷ Kozma, C. Dwarfs in ancient Egypt. PP. 303-311.

¹²⁸ Roger S. Bagnall & Dominic W. Rathbone. *Egypt from Alexander to the Copts*. PP. 1-320

¹²⁹ Budge, E. A. *The Gods of the Egyptians or Studies in Egyptian Mythology*. PP. 1-431; Graves-Brown, C. *Dancing for Hathor: Women in Ancient Egypt*. PP. 1-241; John Baines & Peter Lacovara. (2002). Burial and the dead in ancient Egyptian society: Respect, formalism, neglect. *Journal of Social Archaeology*, 2(1), 5–36.



Fig.37. Bes plaque, Ptolemaic – early Roman period, 1st century A.D. , limestone and paint, (Allen, J. P. (2005). *The Art of Medicine in Ancient Egypt*. pp. 9-12).

Amulets of dwarfs continued to be produced during the Ptolemaic period¹³⁰. The image of the Bes god was worn as an amulet for protection in homes or other places¹³¹ (**Fig.38**). Dwarfs were often depicted working at small tables while sitting on very low stools, allowing their feet to touch the ground¹³².

In some representations, children's features were combined with those of dwarfs, possibly to emphasize the physical and social similarities between them¹³³. In Greek depictions not linked to specific myths, dwarfs were almost always shown as balding or bearded, distinguishing them from children¹³⁴.



Fig.38. An image of a statue of an ordinary dwarf, Walters art museum (Engele, K. *Skeletal Dysplasia: An Analysis of Dwarfism in Ancient Egyptian Culture*. 57–65).

¹³⁰ Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593.

¹³¹ Allen, J. P. (2005). *The Art of Medicine in Ancient Egypt*. pp. 9-12; Riggs, C. (2006). *The Beautiful Burial in Roman Egypt: Art, Identity, and Funerary Religion*. Oxford: Oxford University Press; Budge, E. A. *The Gods of the Egyptians or Studies in Egyptian Mythology*. PP.1-431.

¹³² Heba Mahran & Samar Mostafa Kamal. *Physical Disability in Old Kingdom Tomb Scenes*. 169-192.

¹³³ Åkerblom, J. (2013). *The Fear of Little Men : On the Prehistorical and Historical Treatment of Individuals with Dwarfism*. Visby: Högskolan på Gotland.

¹³⁴ STONER, L. B. (2015). *A Bronze Hellenistic Dwarf in the Metropolitan Museum*. 94-101.

Dwarfs have also been connected to Dionysus myths. If depicted with an overly large phallus, something deeply focused on sexual energy. It may also be interpreted as a sign of mocking¹³⁵ (Fig.39-40). Bes's face could often be seen in relief or painting on walls of houses, beds and head rests, mirror-handles and perfume boxes, and on pottery¹³⁶. Bes is sometimes represented playing upon a harp as a god of war and slaughter¹³⁷.



Fig.39. Statuette of a dwarf. Late Hellenistic or early Imperial 100 B.C.-100 A.D., bronze, with silver in the eyes, Metropolitan museum of art, (STONER, L. B. (2015). A Bronze Hellenistic Dwarf in the Metropolitan Museum. 94-101).



Fig.40. Man, with Dwarfism. Hellenistic period, 2nd century B.C, Metropolitan Museum, (Morris, A. F. *Plato's stepchildren: disability in Ptolemaic Egypt*.pp.1-593).

¹³⁵ Åkerblom, J. *The Fear of Little Men: On the Prehistorical and Historical Treatment of Individuals with Dwarfism*. PP. 1-48; Dunham, D. (1958). *The Egyptian Department and its excavations*. Boston: Museum of Fine Arts; Alcock, J. P. (2006). *Food in the Ancient World*. Westport, CT: Greenwood Publishing Group.

¹³⁶ Černý, J. (1952). *Ancient Egyptian Religion*. PP. 1-159; Lane, E. W. (1996). *Description of Egypt*. *International Journal of Middle East Studies*, 28(4), 565-583; Dixon-Kennedy, M. *Encyclopedia of Greco-Roman Mythology*. PP. 1-370.

¹³⁷ Budge, E. A. *The Gods of the Egyptians or Studies in Egyptian Mythology*. PP. 1-431; Dasen, V. (1988). Dwarfism in Egypt and classical antiquity: Iconography and medical history. *Medical history journal*, 32. doi: 10.1017/S0025727300048237. PP. 253-276.

(4) The Relationship between Smart Technology and Physical Disability in Museums

There is a myriad of ways that museums can market themselves with disabilities people that are a word of mouth and the use of different technologies such as websites and social media¹³⁸ (Fig.41). The concept of access also incorporates physical and communication access such as, “the ability to enter into, move about within, and operate the facilities of a site,” or access “associated with architectural features and technologies such as wheelchair ramps¹³⁹, guiding a visually impaired person and signs for stairs and toilets may be helpful¹⁴⁰ (Fig.42-43). People with disabilities can now access museum collections and information through new digital technologies to promote their goods and services¹⁴¹.



Fig.41.The disability access symbols, Salmen, J. P. (1998). *Everyone's Welcome: The Americans with Disabilities Act and Museums*. Washington, D.C: ERIC Clearinghouse.

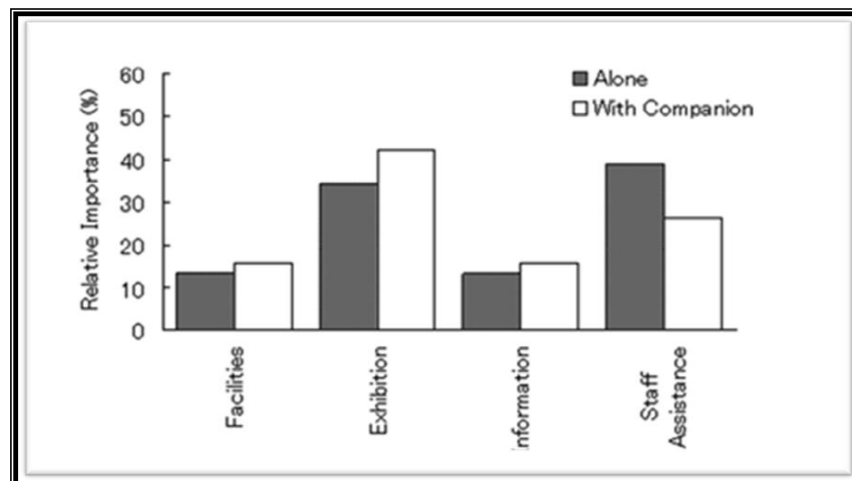


Fig.42. Relative importance of museum services, (Handa, Kozue & Dairoku, Hitoshi & Toriyama, Yoshiko. Investigation of priority needs in terms of museum service accessibility for visually impaired visitors. *PP. 28, 221-234.*

¹³⁸ McMillen, R. (2017). Museum Marketing and Disability Access. *International Journal of Business Management and Commerce*, 2(4), 1-9.

¹³⁹ Katrina Sullivan & Bronwyn Mauldin. (2020). *Accessibility and the Arts: Reconsidering the Role of the Artist*. Claremont: Center for Business & Management of the arts: Claremont graduate university.

¹⁴⁰ Handa, Kozue & Dairoku, Hitoshi & Toriyama, Yoshiko. (2010). Investigation of priority needs in terms of museum service accessibility for visually impaired visitors. *British Journal of Visual Impairment*, 28. doi:10.1177/0264619610374680. PP. 221-234.

¹⁴¹ McMillen, R. Museum Marketing and Disability. PP.1-9.

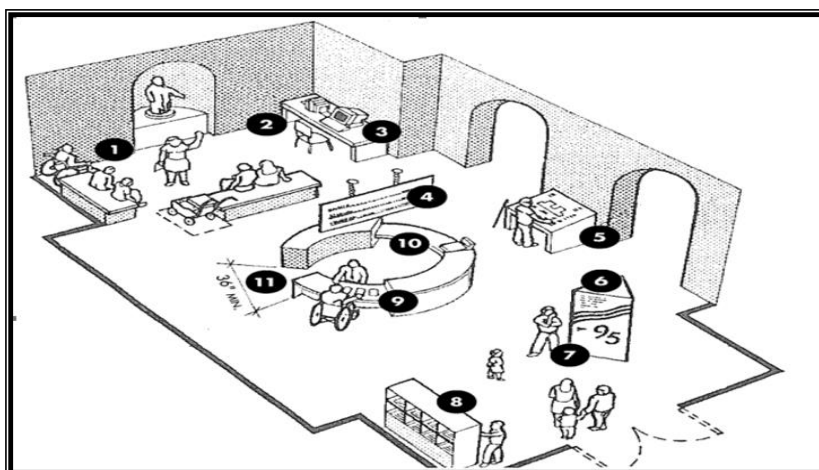


Fig.43. The services for people with disabilities in museums include: (1) Wheelchair parking space, (2) Knee space and moveable chair, (3) Audio computer, (4) Overhead sign with big lettering size, (5) Raised line map with tactile lettering, (6) Information kiosk with audible version of text, (7) Speaker button, (8) Large print brochures, (9) Accessible information/ticketing desk for all visitors, (10) Information desks with accessible work/counter segment and sufficient knee space, (11) Adequate circulation space around and within the information/ticketing desk, (Salmen, J. P. *Everyone's Welcome: The Americans with Disabilities Act and Museums*. pp.1-151).

(4-1) Facilities for Visually Impaired Museum's Visitors

(4-1-1) Separate entrances and White Cane

In particular, the white cane warns the blind individual in the direction of his walking and it contains eight different tones according to the location of the obstacles¹⁴². In the meantime, the cane is the most common aid for mobility also is painted white as well as some people now use special canes which bounce laser beams or sound waves off objects and they vary in size, shape, and method of operation but all basically serve the same purpose¹⁴³ (Fig.44-45).



Fig.44. Cane detection of wall hung case, (Majewski, J. *Part of Your General Public Is Disabled*. PP. 229-293)

¹⁴² زينب صادق مصطفى، حسن عبد علي. سياحة ذوي الإعاقة متطلباتها في السفر الإقامة الإرشاد السياحي. ص ٤٩٣-١.

¹⁴³ Majewski, J. (1987). *Part of Your General Public Is Disabled*. PP. 229-293.



Fig.45. Cane for blind people and separate entrances in the museums (Majewski, J. *Part of Your General Public Is Disabled*. PP. 229-293; Dincer, Fusun & Ozcit, Hulya, et al. (2019). *Accessible Museums for Visually Impaired: A Case Study from Istanbul*. *Journal of Tourismology*, 5, 1-15).

As well as use a brightly colored guide line to act as a visual trail that helps sighted and visually impaired visitors¹⁴⁴ (**Fig.46**). For individuals who are blind or have low vision, using canes and brightly colored guide lines is a helpful method, including during guided tours and along nature trails¹⁴⁵.

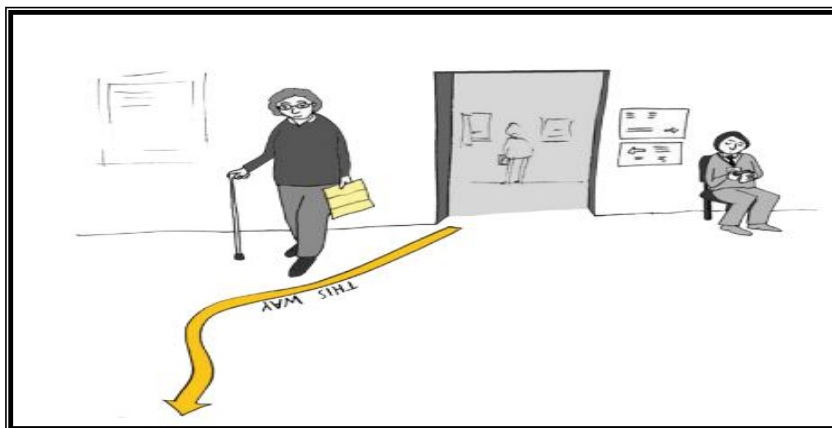


Fig.46. brightly colored guide line for people with low vision and visually impaired visitors, (<https://www.thehublited.co.uk>. 2022, 1 8).

(4-1-2) Braille Guide and Elevators

It seems, *Braille* is an embossed font for writing and reading by the visually impaired and the font is based on a combination of six dots¹⁴⁶ as well as Braille and tactile characters to identify the location and function of various controls¹⁴⁷ (**Fig.47**).

¹⁴⁴ <https://www.thehublited.co.uk>. (2022, 1 8). (A. E.-D. PEOPLE, Producer)

¹⁴⁵ Majewski, J. (2013). *Smithsonian Accessibility Program: Smithsonian Guidelines for Accessible Exhibition Design*. Washington, D.C.: National Museum of American History. PP.1-106.

¹⁴⁶ Mariya Yasenovska & Olena Zinenko. (2020). *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. Germany: Friedrich-Ebert-Stiftung (FES). PP.1-32.

¹⁴⁷ Majewski, J. *Smithsonian Accessibility Program*. PP.1-106; McMillen, R. *Museum Marketing and Disability Access*, PP. 1-9; <https://www.openexhibits.org/paper/making-museum-exhibits>. (2022, 12 9); Yıldız, S. *A Holistic View on Contemporary Art Museums in the Context of Accessible Tourism-*, pp. 337-348.

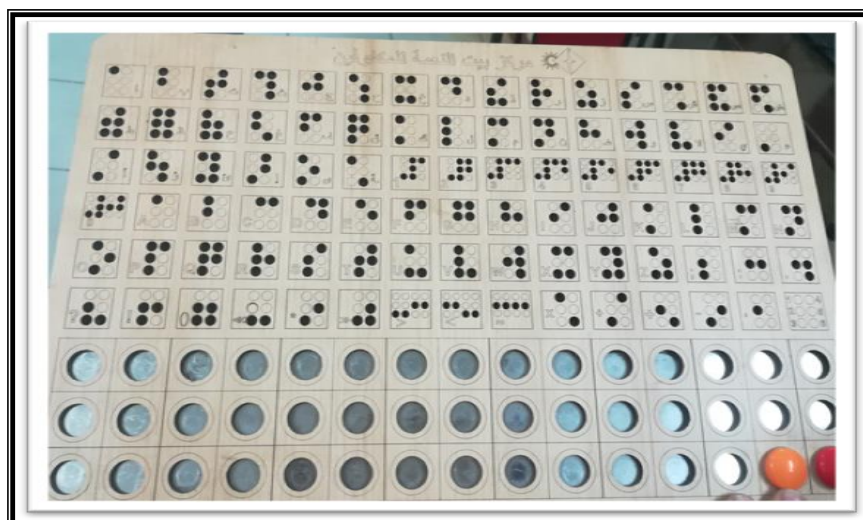


Fig.47. Board of Braille guide, EL-Resala Disabled people's organization, (Researcher picture).

As well as for the blind people in the building must contain special equipment for them, such as guiding boards written in Braille letters, and elevators equipped with a talking device and Braille letters¹⁴⁸ also printed matter that can be available such as labeling, publications and signage¹⁴⁹ (**Fig.48**). Therefore, there must be employees who are well-versed in communicating with people with disabilities, such as training in understanding sign, writing and reading in Braille¹⁵⁰.

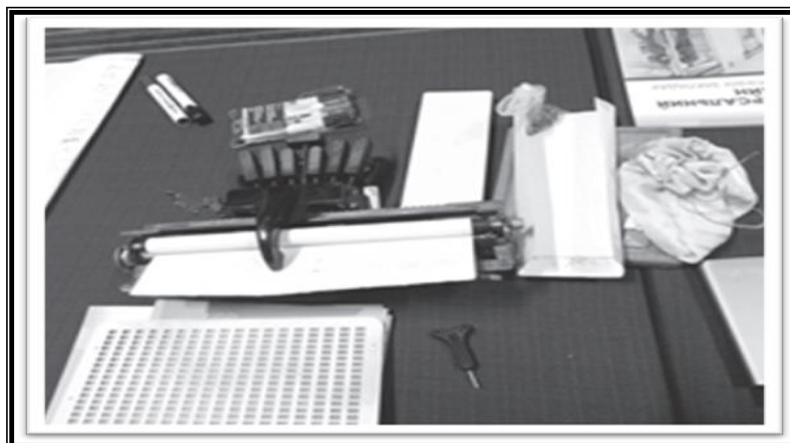


Fig.48. Picht typewriter for printing in Braille, (Mariya Yasenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS*. PP.1-32).

(4-1-3) Tactile Models

Currently, some museums are using new programs as marketing tools to reach specific audiences with disabilities¹⁵¹. In other word, a tactile model is a model or copy of an artwork that could be touched to examine it to give people with visual impairments the opportunity to get acquainted with a specific object¹⁵² (**Fig.49-50**). To cater to the needs of the blind, it is

¹⁴⁸ زينب صادق مصطفى، حسن عبد علي. سياحة ذوي الإعاقة متطلباتها في السفر الإقامة الإرشاد السياحي، ص ١-٤٩٣.

¹⁴⁹ Majewski, J. *Smithsonian Accessibility Program*. PP.1-106

¹⁵⁰ زينب صادق مصطفى، حسن عبد علي. سياحة ذوي الإعاقة متطلباتها في السفر الإقامة الإرشاد السياحي، ص ١-٤٩٣.

¹⁵¹ McMillen, R. *Museum Marketing and Disability Access*. PP.1-9.

¹⁵² Mariya Yasenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32.

essential to provide audio guides and obstacle detection systems, enabling tactile exploration of the artworks or architectural elements ¹⁵³.



Fig.49. Touch tours with audio description are popular with many blind and partially sighted people, (Taylor, M. (2008). *Disability: A Toolkit for Museums Working Towards Inclusion*. California, The Foundation Cultural Heritage without Borders – CHwB).



Fig.50. Tactile small replicas of original models with 3D printed copies, (TATIC, D. (2015). *Access for People with Disabilities to Culture, Tourism, Sports and Leisure Activities: Towards Meaningful and Enriching Participation*. Strasbourg: Council of Europe; <https://www.cummermuseum.org>. (2022, 12 10); María Eugenia, Reyes & Criado-García-Legaz, Fernando & Camùnez, José & Casado-Pérez, María. (2021). Accessibility to Cultural Tourism: The Case of the Major Museums in the City of Seville. *Sustainability*, 13, 1-28. doi:10.3390/su13063432).

Some museums print 3D replicas of museum objects and touch tours for people who are blind or visually impaired to engage with the museum and its collection by using senses, such

¹⁵³ Migliaccio, G. (2018). Accessible museums in Italy: an overview. *African Journal of Hospitality, Tourism and Leisure*, 7(6), 1-16.

as touch¹⁵⁴. This way to bring blind people into contact with museums and the influence can be seen in the museum “touch and see” and “tactile” galleries¹⁵⁵ (Fig.51).



Fig.51. The Egyptian Museum in Cairo offers guided tours specifically designed for people with low vision, conducted by visually impaired staff members, (Zakaria, N. N. (2020). *Barriers to Social Inclusion with the Egyptian Museums; New Approach Towards Disability. Curator the Museum Journal*, 63(1), 115-130; Jocelyn Dodd & Richard Sandell, et al. (2004). *BURIED IN THE FOOTNOTES: THE REPRESENTATION OF DISABLED PEOPLE IN MUSEUM AND GALLERY COLLECTIONS*. Leicester: University of Leicester).

Participants with these disabilities greatly enjoyed an opportunity to touch objects (or replicas) and felt that this made a museum visit worthwhile¹⁵⁶ (Fig.52-53). The design of the tactile display and the Braille writing is an integral part of the display can be used in the museums¹⁵⁷.



Fig.52. Tactile small replicas of original models with 3D printed copies, (<https://www.thehublimited.co.uk>. (2022, 1 8). (A. E.-D. PEOPLE, Producer).

¹⁵⁴ McMillen, R. *Museum Marketing and Disability Access*, PP.1-9.

¹⁵⁵ McKENZIE, P. (1979). *MUSEUM ACCESS FOR VISUALLY IMPAIRED VISITORS*. Texas: Faculty of Texas Tech University.

¹⁵⁶ Peta Landman & Kiersten Fishburn, et al. (2005). *Many Voices Making Choices: Museum Audiences with Disabilities*. Sydney: Australian Museum; Dimitrova-Radojichikj, D. (2017). *Museums: Accessibility to visitors with visual impairment*. Sofia, Bugaria. PP.1-10; McMillen, R. *Museum Marketing and Disability Access*, PP.1-9.

¹⁵⁷ Miesen, L. C. (2018). *INCLUSIVE DESIGN EXPERTISE FOR AN ACCESSIBLE MUSEOGRAPHY: The inclusive museum - Challenges and Solutions, State of the Art and Perspectives*. In J. B. Gather (Ed.), *Proceedings of the 1st and 2nd COME-IN! -Thematic Conferences*. Udine: the Interreg CENTRAL EUROPE programme. PP.26-35; Mariya Yassenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32; MARTINS, P. R. *THE REPRESENTATION OF DISABILITY IN DGPC MUSEUMS COLLECTIONS*. PP. 13-33.



Fig.53. Visual tactile display showing a shipwreck, (Miesen, L. C. *INCLUSIVE DESIGN EXPERTISE FOR AN ACCESSIBLE MUSEOGRAPHY*. pp. 26-35).

(4-1-4) Websites and disabilities people

Websites play a crucial role in museums' accessibility and disability programs, offering a platform to communicate and advertise their accommodations for visitors with various disabilities¹⁵⁸. These sites ensure convenient access to content for individuals with sight and hearing impairments¹⁵⁹. To cater to diverse needs, websites should include features¹⁶⁰ such as font size adjustments, color scheme and contrast adjustments, and alternative texts for visual components that can be read by screen readers. Additionally, for people with motility disorders, the option to navigate the site exclusively using the keyboard is essential. Ensuring websites are inclusive enables all individuals, including those with disabilities, to access and benefit from the information and resources provided¹⁶¹ (**Fig.54**).



Fig.54. The museum's website possible to choose color, text and font, (Mariya Yasenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32).

¹⁵⁸ McMillen, R. Museum Marketing and Disability Access, PP.1-9; Susan v. Levine & Susannah Cassedy O'Donnell, et al. (2017). *Museum: A benefit of membership in the American Alliance of museums*. Arlington, USA: museum: American Alliance of museums.

¹⁵⁹ Mariya Yasenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32.

¹⁶⁰ زينب صادق مصطفي، حسن عبد علي. سياحة ذوي الإعاقة متطلباتها في السفر الإقامة الإرشاد السياحي، ص ١-٩٣.

¹⁶¹ Mariya Yasenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32.

(4-1-5) Audio Device, Gloves, 3D Glasses and disabilities people

Electronic gloves contain sensitive figures that convey the real feeling of touching things to the person (**Fig.55**). A trained audio describer provides live narration of objective descriptions of visual elements via headphones and a small transmitter¹⁶². *Audio device* is placed around the neck or placed around the head of the blind person which alerts the blind person¹⁶³. Audio description to provide information about key visual elements for the benefit of visitors with visual impairment¹⁶⁴ (**Fig.56**).



Fig.55. Electronic gloves to touch the artifacts, (Mariya Yasenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32).



Fig.56. Audio Device and Remote control around the neck with visual impairments, (Mariya Yasenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32).

¹⁶² Majewski, J. *Smithsonian Accessibility Program: Smithsonian Guidelines for Accessible Exhibition Design*. PP.1-106.

¹⁶³ زينب صادق مصطفى، حسن عبد علي. سياحة ذوي الإعاقة متطلباتها في السفر الإقامة الإرشاد السياحي، ص ٤٩٣-١.

¹⁶⁴ Mariya Yasenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32.

3D Glasses are glasses that give moving and stereoscopic three-dimensional images which the tourist can see the place as if it is actually that place, soul and body¹⁶⁵ (Fig.57).

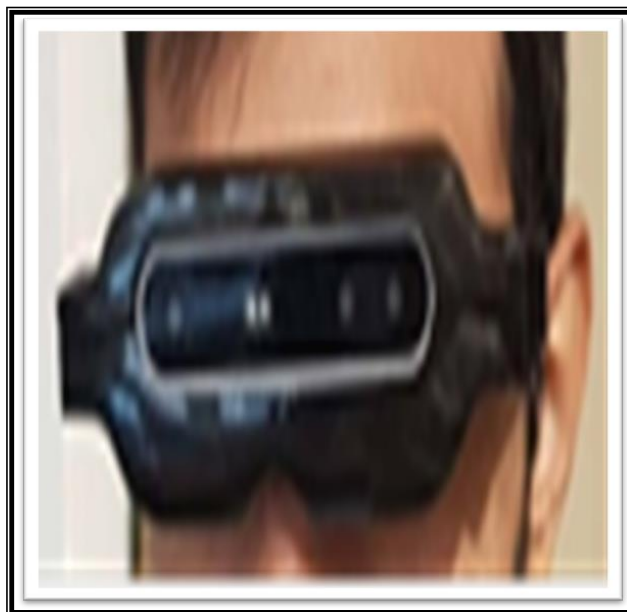


Fig.57. 3D glasses for disabilities people, (Mariya Yassenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32).

(4-2) Facilities for Mobility and Physical Impairments Museum's Visitors

(4-2-1) Wheelchairs and Bathrooms

Wheelchair accessibility to someone with a mobility disability¹⁶⁶ (Fig.58) and some people who use wheelchairs cannot extend their arms to full length¹⁶⁷ (Fig.59).

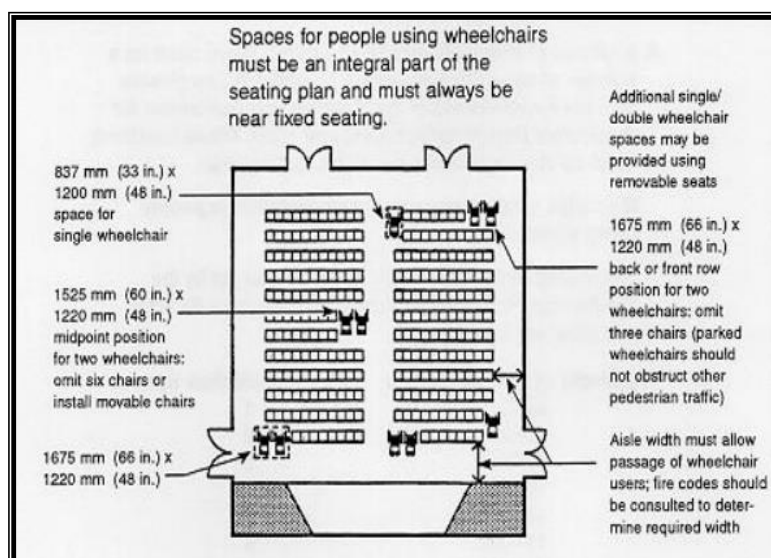


Fig.58. Wheelchair seating dispersed throughout seating area, (Mariya Yassenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32).

¹⁶⁵ زينب صادق مصطفى، حسن عبد علي. سياحة ذوي الإعاقة متطلباتها في السفر الإقامة الإرشاد السياحي، ص ١-٤٩٣.

¹⁶⁶ Salmen, J. P. *Everyone's Welcome: The Americans with Disabilities Act and Museums*. pp.1-151.

¹⁶⁷ Majewski, J. *Smithsonian Accessibility Program: Smithsonian Guidelines for Accessible Exhibition Design*. PP.1-106.

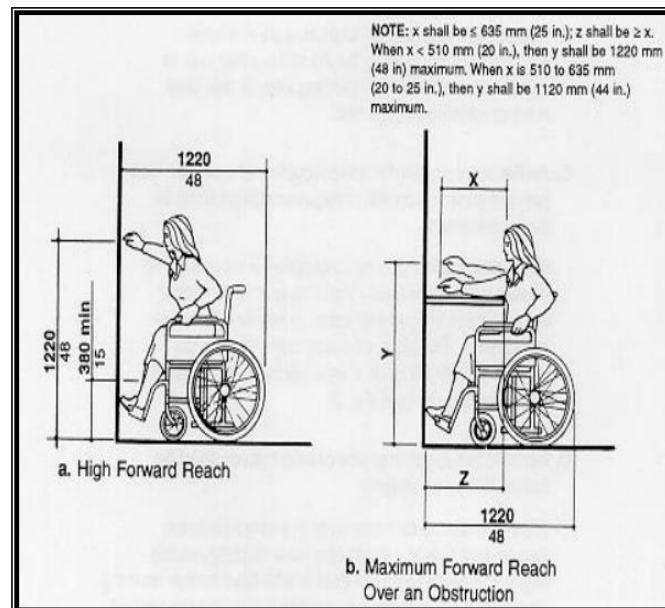


Fig.59. Forward reach of Wheelchair, (Majewski, J. *Smithsonian Accessibility Program: Smithsonian Guidelines for Accessible Exhibition Design*. PP.1-106).

As well as the wheelchair symbol should be used to indicate access for individuals with limited mobility, including wheelchair users¹⁶⁸ (**Fig.60**).



Fig.60. Symbol of wheelchair, (Mariya Yassenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32).

Controls, such as buttons, must be within the reach range of a wheelchair user and should not be obstructed by shelves or furniture. Additionally, if the floor is low but the glass is high, it can block the view of the interior for both visitors with visual and mobility impairments¹⁶⁹ (**Fig.61-62**).

¹⁶⁸ Mariya Yassenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32).

¹⁶⁹ Majewski, J. *Smithsonian Accessibility Program: Smithsonian Guidelines for Accessible Exhibition Design*. PP.1-106; Taylor, M. *Disability: A Toolkit for Museums Working Towards Inclusion*. PP. 1-120; Esther Fox & Jane Sparkes. (2021). *Curating for Change: Disabled People Leading in Museums*. Heritage fund.

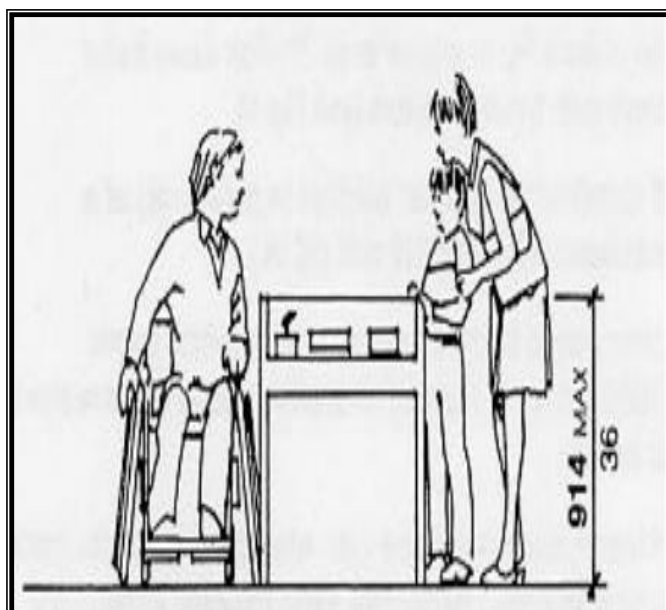


Fig.61. Height of table case, (Majewski, J. *Smithsonian Accessibility Program: Smithsonian Guidelines for Accessible Exhibition Design*. PP.1-106).



Fig.62. Lots of seating and information at a low level and convenient angle, (Taylor, M. *Disability: A Toolkit for Museums Working Towards Inclusion*. PP. 1-120).

In the meantime, providing charging points for moving electric wheelchair as well as ramps for the movement of these wheelchair¹⁷⁰ (Fig.63-64). Benches and fixed seating require a minimum space of 760 mm by 1220 mm at one end to accommodate a wheelchair user sitting next to someone on the bench or transferring onto the seating.¹⁷¹ (Fig. 65).

¹⁷⁰ زينب صادق مصطفى، حسن عبد علي. سياحة ذوي الإعاقة متطلباتها في السفر الإقامة الإرشاد السياحي، ص ٤٩٣-١.

¹⁷¹ Mariya Yassenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32



Fig.63. Some visitors with visual and mobility impairments might need to borrow a wheelchair, (Taylor, M. *Disability: A Toolkit for Museums Working Towards Inclusion*. PP. 1-120).



Fig.64. The space is equipped with a low angled ramp and handrails, (Mariya Yasenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32).



Fig.65. Benches and fixed seating, (Mariya Yasenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32).

Bathroom are designed in places that are easily accessible to people with disabilities and bathroom must be equipped with all technical equipment that facilities moving from wheelchairs to clean mechanisms¹⁷².

¹⁷² زينب صادق مصطفى، حسن عبد علي. سياحة ذوي الإعاقة متطلباتها في السفر الإقامة الإرشاد السياحي، ص 1-493.

(4-3) Facilities for people with a hearing impairment Museum's Visitors

People with deafness and hearing impairments require audio information to be translated into printed text placed no higher than 1015 mm (40 in.) above the floor. Museums can provide accessibility tools like video phones, text phones, and devices that convert audio signals into written characters for hearing-impaired individuals to read¹⁷³.

Induction loops are another helpful device, transmitting audio information directly to people with hearing impairments who use hearing aids or cochlear implants. These loops can be portable or individual¹⁷⁴.

To ensure a welcoming environment for the Deaf and hearing-impaired community, museum staff should undergo training to understand their specific needs and be familiar with available equipment and resources. This enables them to provide effective assistance and support during their visit¹⁷⁵.

(4-4) Disability people and Virtual Tours of Museum's Visitors

A tactile sound informant in Braille allows people with full or partial visual impairments to listen to pre-recorded audio messages by pressing the tactile button¹⁷⁶ (**Fig.66**) as well as instructional screens that provide tourist guide services to visitors through screens that are placed either at the main entrances to these sites or in appropriate places inside them¹⁷⁷ (**Fig.67**).



Fig.66. Tactile sound, Audio description for visual impairments, (Abdelrazik, A. M. (2021). Accessible Museums' Facilities for Visually Impaired Visitors: Applicable Project in the Museum of Islamic Art in Cairo. *Journal of Architecture, Art and humanistic studies*, 6(2). doi:10.21608/mjaf.2020.46902.2016.

¹⁷³ المرجع السابق، ص ٤٩٣-١.

¹⁷⁴ Mariya Yassenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32.

¹⁷⁵ Örnek, B. M. (2015). *Inclusive Museums: Accessible Art for People with Disabilities in Turkey*. Istanbul: Koç University; Elmoghazy, M. A. (2019). EXPLORING THE EFFECT OF EMOTIONS ON MOBILITY-DISABLED TOURISTS' EXPERIENCE AT MUSEUMS. *European Journal of Hospitality and Tourism Research*, 7(1). doi: http://www.eajournals.org. PP. 9-22; <https://www.thehublimited.co.uk>. (2022, 1 8). (A. E.-D. PEOPLE, Producer; Taylor, M. *Disability: A Toolkit for Museums Working Towards Inclusion*. PP. 1-120; Monica Cerdan Chiscano & Ana Isabel Jiménez-Zarco. (2021). Towards an Inclusive Museum Management Strategy. An Exploratory Study of Consumption Experience in Visitors with Disabilities. The Case of the CosmoCaixa Science Museum. *Sustainability*, 13(2), doi: <https://doi.org/10.3390/su13020660>. PP. 1-14.

¹⁷⁶ Mariya Yassenovska & Olena Zinenko. *DEMOCRACY AND HUMAN RIGHTS: BEST PRACTICES OF INCLUSION*. PP.1-32

¹⁷⁷ زينب صادق مصطفى، حسن عبد علي. سياحة ذوي الإعاقة متطلباتها في السفر الإقامة الإرشاد السياحي، ص ٤٩٣-١.



Fig.67. Instructional screens and Augmented reality, (Sylaiou S.& Liarokapis F. & Sechidis L. & Patias P. & Georgoula O. (2005). VIRTUAL MUSEUMS: FIRST RESULTS OF A SURVEY ON METHODS AND TOOLS. *International Symposium, XX*, 1-7).

(5) Archaeological Museums and Disability people

The researcher had made a field study for number of archaeological museums in Alexandria and Cairo and studied the various facilities available in these museums to be used by impairments people with different disabilities as following:

(5-1) National Museum in Alexandria

The museum was inaugurated on September 1st, 2003, and is regarded as one of the world's most exceptional museums. Its primary purpose is to narrate the story of Egypt across various historical periods, from the past to the present¹⁷⁸.

(5-1-1) Facilities for Visually Impaired Museum's Visitors in National Museum

The national museum used Braille way beside many monumental pieces for the visitors that had visually impaired (researcher description) (**Fig.68-71**).



Fig.68. Visually Impaired facilities, (researcher picture)

¹⁷⁸ <http://www.alexandria.gov.eg/Alex/english/National%20Museum%20of%20Alexandria.html>. (2023, 2 18).



Fig.69. Visually Impaired facilities, (researcher picture)



Fig.70. Visually Impaired facilities, (researcher picture)

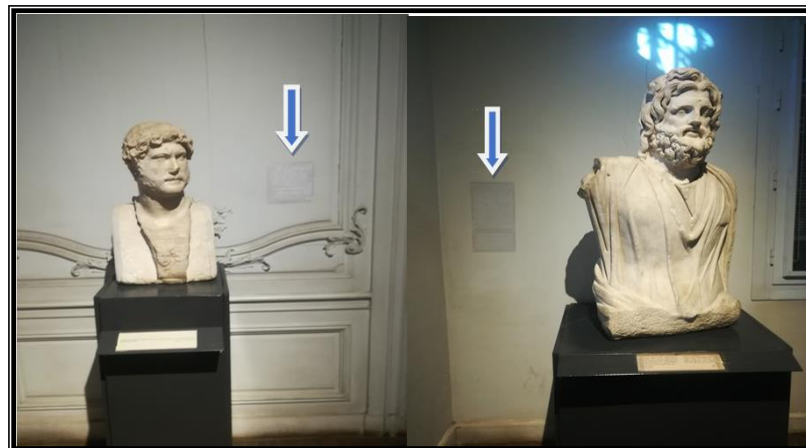


Fig.71. Visually Impaired facilities, (researcher picture)

(5-1-2) Facilities for people with a hearing impairment Museum's Visitors in National Museum

The national museum had used many signs for visit path in many floors of the museums and beside other various places such as toilets and the stairs for the visitors that had hearing impairment (researcher description) (**Fig.72-74**).



Fig.72. Hearing Impaired facilities, (researcher picture)

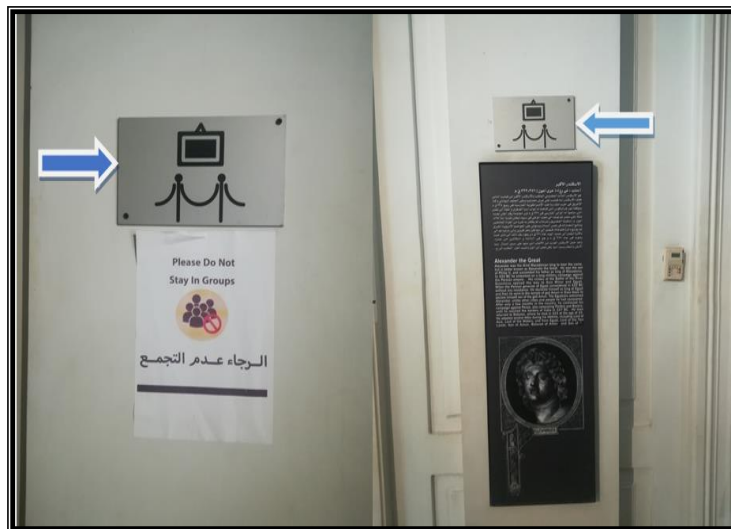


Fig.73. Hearing Impaired facilities, (researcher picture)



Fig.74. Hearing Impaired facilities, (researcher picture)

(5-1-3) Facilities for Mobility and Physical Impairments Museum's Visitors in National Museum

Multiple ways are used to help people with physical disabilities, such as elevators and devices that work like ascending ramps through devices that are placed on special stairs for them (researcher description) (Fig. 75-76).



Fig.75. Device as access ramp for Physical Impaired facilities, (researcher picture)



Fig.76. Elevator for Physical Impaired facilities, (researcher picture)

(5-2) Egyptian Museum in Cairo

Clearly, the archaeological Egyptian Museum in Cairo is the oldest museum in the Middle East and has the largest collection of antiquities in the world from the Predynastic times to the Graeco-Roman period¹⁷⁹.

(5-2-1) Facilities for Visually Impaired Museum's Visitors in Egyptian Museum in Cairo

The Egyptian museum used Braille way beside many monumental pieces as well as tactile models for the visitors that had visually impaired. The Egyptian museum had used many signs

¹⁷⁹ <https://www.egyptianmuseumcairo.com/egyptian-museum-cairo>. (2023, 2 18).

for visit path in many floors with different historical ages of the museum and beside other various places such as toilets and map of the museum with Braille way for the visitors that had hearing impairment (researcher description) (**Fig.77-85**).



Fig.77.Tactile model and Braille Labels of monumental pieces for visually impaired people in the Egyptian museum, (researcher picture)

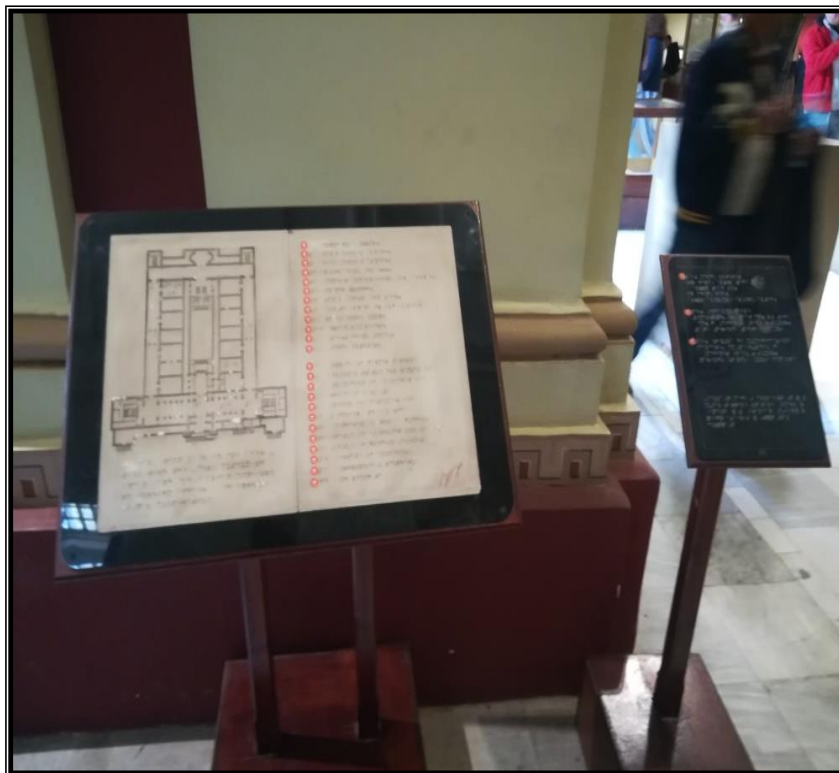


Fig.78.Tactile model and Braille Labels of the plan of the Egyptian museum for visually impaired people, (researcher picture)



Fig.79. Braille Labels of visit path for visually impaired people in the Egyptian museum, (researcher picture)



Fig.80. Braille Labels of visit path for visually impaired people in the Egyptian museum, (researcher picture)



Fig.81. Braille Labels of Elevator for visually impaired people in the Egyptian museum, (researcher picture)



Fig.82. Braille Labels of visit path for visually impaired people in the Egyptian museum, (researcher picture)



Fig.83. Braille Labels of Monumental pieces for visually impaired people in the Egyptian museum, (researcher picture)



Fig.84. Braille Labels of Monumental pieces for visually impaired people in the Egyptian museum, (researcher picture)



Fig.85. Braille Labels of Monumental pieces for visually impaired people in the Egyptian museum, (researcher picture)

(5-1-3) Facilities for Mobility and Physical Impairments Museum's Visitors in The Egyptian Museum

Many ways are used to help people with physical disabilities in the Egyptian museum, such as elevators, access ramps in the entrance to the museum, wheelchairs and benches for knee spaces and moveable chairs (researcher description) (**Fig.86-89**).



Fig.86. Access Ramp leading to the main entrance of the museum building for Physical Impaired facilities – Egyptian museum in Cairo, (researcher picture)



Fig.87. Elevator for Physical Impaired facilities, (researcher picture)



Fig.88. Benches and fixed seating as knee spaces and moveable chair for Physical Impaired facilities in the Egyptian museum, (researcher picture)



Fig.89. Wheelchairs in the Egyptian museum for Physical Impaired facilities in the Egyptian museum, (researcher picture)

(5-2) Geir Anderson Museum in Cairo

It seems, the Geyer Anderson Museum is a combination of two houses dating to the Ottoman period (16-17th century). In addition, there were several families lived in the houses until it become under the ownership of a lady from Crete, therefore the house became known as Bayt al-Kritlyya¹⁸⁰.

(5-2-1) Facilities for Visually Impaired Museum's Visitors in National Museum

The Geyer Anderson Museum used Braille way beside many monumental pieces for the visitors that had visually impaired (researcher description) (**Fig.90-92**).

¹⁸⁰ <https://egymonuments.gov.eg/en/museums/gayer-anderson-museum>. (2023, 2 18).



Fig.90. Braille Labels of Monumental pieces for visually impaired people in the Egyptian museum, (researcher picture)

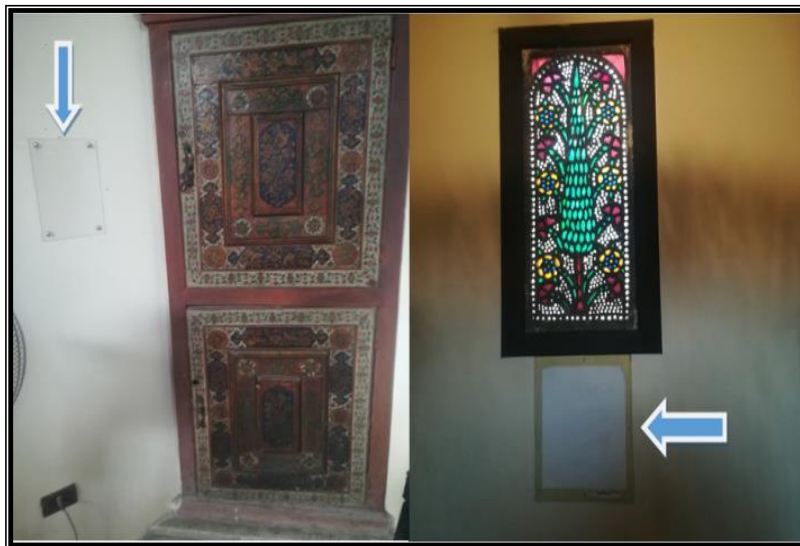


Fig.91. Braille Labels of Monumental pieces for visually impaired people in the Egyptian museum, (researcher picture)



Fig.92. Braille Labels of Monumental pieces for visually impaired people in the Egyptian museum, (researcher picture)

Research methodology

Sampling and Data Collection

The study's sample consisted of both abled and disabled visitors who had visited archaeological sites in Alexandria, such as the Catacomb of Kom EL-Shoqafa, Pompey's pillar, and the Roman Amphitheatre. It also included visitors to museums in Alexandria and Cairo, like the Geir Andron museum, Egyptian museum, and National museum, as well as members of disabled associations in Alexandria, such as EL-Nour disabled people organization and EL-Resala disabled people organization.

To ensure a comprehensive and representative sample, surveys were conducted at various times during the week. Out of the 400 distributed questionnaires, 380 responses were considered valid. However, 25 questionnaires were excluded due to incomplete answers. Therefore, the final analysis comprised 355 questionnaires to assess the role of archaeological museums in implementing smart technology to enhance services for physically handicapped tourists in Alexandria and Cairo (**Fig.93**).



Fig.93. A collage picture of the sample study, (researcher picture)

Questionnaire design and Measurement Items

This research utilized a survey as the data collection method. A self-administered questionnaire was designed to measure various variables, including Equipment and display spaces, Museum audio and visual materials, and Required equipment. Each variable consisted of multiple items to achieve the research objectives. The questionnaire comprised eleven sections, with Section 1 containing 5 questions to gather demographic characteristics of the respondents, as presented in Table 1. The remaining sections employed a 5-point Likert Scale, where 1 represented "strongly disagree" and 5 denoted "strongly agree."

Data analysis and results

This research aims to assess the interrelationship between various factors. (disabilities people and their audio, visual and physically needs in the museums). Besides, at museums, archaeological sites and disabled associations studying the mediating effects of audio, visual and physically needs that mediating the relationship between smart technology and disabled people needs in the museums as show in the next tables.

Table.1 Demographic profile: Distribution of the studied samples according to demographic profile (n = 355)

Demographic profile	No.	%
Age (years)		
18-25	142	40.0
26-35	84	23.7
36-45	80	22.5
Over 45	49	13.8
Gender		
Female	206	58.0
Male	149	42.0
Nationality		
Africa	190	53.5
Middle East	96	27.0
Europe	29	8.2
Americas	21	5.9
Asia and the pacific	19	5.4
Marital status		
Single	212	59.7
Married	102	28.7
Other	41	11.5
Education		
High school	203	57.2
University student / Graduate	97	27.3
Postgraduate	55	15.5

Results

Characteristic of Respondents

As evident from the previous table (demographic characteristics of the respondents), 53% of the participants were from Africa, 58% were female, 40% fell within the age group of 18 to 25 years, approximately 59% were single, and 57% had completed at least high school.

Validating the measuring instruments

The data was input into the computer and analyzed using IBM SPSS software package version 20.0 (Armonk, NY: IBM Corp). Qualitative data were presented as numbers and percentages. The normality of distribution was checked using the Kolmogorov-Smirnov test. Quantitative data were described using the range (minimum and maximum), mean, standard deviation, and median. The significance of the results was assessed at the 5% level.

Table (2): Mean Scores and the reliability statistics of the measurement model and Distribution of the studied samples according to equipment and display spaces items (n=355)

Equipment and display spaces	Strongly disagree		Disagree		Neither agree or disagree		Agree		Strongly agree		Rank
	No.	%	No.	%	No.	%	No.	%	No.	%	
6. Which of the following equipment are required to facilitate the visit of disabilities tourists?											
The museum provides separate entrances for disabilities people.	10	2.8	29	8.2	46	13.0	130	36.6	140	39.4	11
The museum provides a wheelchair ramp at the museum entrance	6	1.7	12	3.4	35	9.9	125	35.2	177	49.9	7
The museum provides elevators for disabilities people.	4	1.1	5	1.4	52	14.6	140	39.4	154	43.4	10
The museum provides a bathroom suitable for disabilities people	10	2.8	10	2.8	30	8.5	136	38.3	169	47.6	9
The museum provides enough space for the use of wheelchairs	2	0.6	2	0.6	49	13.8	116	32.7	186	52.4	3
The museum provides a level of lighting suitable for the visually impaired	2	0.6	1	0.3	24	6.8	124	34.9	204	57.5	1
The museum provides a white cane for the blind	9	2.5	6	1.7	31	8.7	121	34.1	188	53.0	2
The museum provides wheelchairs and charging points	0	0.0	9	2.5	44	12.4	119	33.5	183	51.5	4
The museum provides door handles suitable for disabilities people.	1	0.3	12	3.4	36	10.1	125	35.2	181	51.0	5
The museum provides capitalization for the exhibits	1	0.3	3	0.8	28	7.9	145	40.8	178	50.1	6
The museum provides small replicas alongside original models for the blind	12	3.4	5	1.4	19	5.4	149	42.0	170	47.9	8
7. How deal museum staff with museums disabilities visitors?											
Museum staff have the necessary skills to deal with disabilities people, such as sign language	4	1.1	5	1.4	51	14.4	163	45.9	132	37.2	2
The museum organizes guided tours for disabilities visitors	2	0.6	15	4.2	45	12.7	132	37.2	161	45.4	1

Additionally, according to the previous table, "Equipment and Display spaces" includes 13 items. The highest items were "(The museum provides a level of lighting suitable for the visually impaired). As well as, the lowest (The museum provides separate entrances for disabilities people). Therefore, the results have confirmed.

Table (3): Mean Scores and the reliability statistics of the measurement model and Distribution of the studied samples according to museum audio and visual materials items (n=355)

Museum audio and visual materials	Strongly disagree		Disagree		Neither agree or disagree		Agree		Strongly agree		Rank
	No.	%	No.	%	No.	%	No.	%	No.	%	
8. What are the smart and digital technology tools available in the museum for disabilities visitors?											
The museum's website shows the museum's facilities for disabilities visitors	2	0.6	7	2.0	59	16.6	78	22.0	209	58.9	7
The voice description technology is found with a remote control around the neck of the blind	0	0.0	21	5.9	46	13.0	77	21.7	211	59.4	6
There are electronic gloves to touch the artifacts for the blind	12	3.4	22	6.2	37	10.4	63	17.7	221	62.3	5
There are multi-sensory displays such as sight and sound	9	2.5	24	6.8	20	5.6	155	43.7	147	41.4	8
There are 3D glasses for the blind to avoid obstacles inside the museum	12	3.4	19	5.4	35	9.9	45	12.7	244	68.7	4
There are virtual tours for disabilities people	8	2.3	18	5.1	32	9.0	156	43.9	141	39.7	10
There is a 3D printing technology for the contents of the museum for the hearing and visually impaired	11	3.1	18	5.1	22	6.2	56	15.8	248	69.9	2
The museum has a tactile sound in Braille for the blind	2	0.6	31	8.7	29	8.2	45	12.7	248	69.9	2
Hearing loops exist for hearing impairments	0	0.0	32	9.0	20	5.6	157	44.2	146	41.1	9
A palantypist as screen writing device exists to display text on a screen for the hearing impaired	4	1.1	18	5.1	27	7.6	55	15.5	251	70.7	1

At that point, according to the previous table, "Museum Audio and visual materials" includes 10 items. The highest items were "(A palantypist as screen writing device exists to display text on a screen for the hearing impaired). In addition, the lowest (There are virtual tours for disabilities people). Furthermore, the results have confirmed.

Table (4): Mean Scores and the reliability statistics of the measurement model and Distribution of the studied samples according to required equipments items (n=355)

Required equipments	Strongly disagree		Disagree		Neither agree or disagree		Agree		Strongly agree		Rank
	No.	%	No.	%	No.	%	No.	%	No.	%	
9. What are the most required Equipments to make visiting museums more accessible for disabilities visitors?											
The museum provides a wheelchair ramp at the museum entrance	3	0.8	10	2.8	51	14.4	109	30.7	182	51.3	6
The museum provides wheelchairs and charging points	5	1.4	6	1.7	64	18.0	117	33.0	163	45.9	10
The museum provides small replicas alongside original models for the blind	8	2.3	13	3.7	21	5.9	149	42.0	164	46.2	9
There are multi-sensory displays such as sight and sound	6	1.7	15	4.2	10	2.8	125	35.2	199	56.1	3
The museum has a tactile sound in Braille for the blind	6	1.7	4	1.1	24	6.8	127	35.8	194	54.6	5
There are 3D glasses for the blind to avoid obstacles inside the museum	13	3.7	7	2.0	26	7.3	138	38.9	171	48.2	8
There is a 3D printing technology for the contents of the museum for the hearing and visually impaired	4	1.1	9	2.5	29	8.2	134	37.7	179	50.4	7
Hearing loops exist for hearing impairments	3	0.8	8	2.3	32	9.0	114	32.1	198	55.8	4
There are electronic gloves to touch the artifacts for the blind	7	2.0	9	2.5	33	9.3	106	29.9	200	56.3	2
The museum's website shows the museum's facilities for disabilities visitors	4	1.1	8	2.3	20	5.6	78	22.0	245	69.0	1

Also, according to the previous table, "Required Equipments" includes 10 items. The highest items were (The museum's website shows the museum's facilities for disabilities visitors). It seems, the lowest (The museum provides wheelchairs and charging points). Furthermore, the results have confirmed.

Mediation analysis

In particular, to test the mediation of smart technology at archeological museums and physically handicapped visitors so the next seven tables used to analyze this mediation between three main measures "Equipment and display spaces-Museum audio and visual materials-Required Equipments".

Table (5): Mean Scores and the reliability statistics of the measurement model and Descriptive analysis of the studied samples according to scores (n = 355)

		Total Score			% Score
		Min. – Max.	Mean ± SD.	Median	
Equipment and display spaces	(13 – 65)	17.0 – 65.0	55.71 ± 8.03	57.0	82.13 ± 15.45
Museum audio and visual materials	(10 – 50)	17.0 – 50.0	43.21 ± 8.46	47.0	83.02 ± 21.14
Required Equipments	(10 – 50)	10.0 – 50.0	43.46 ± 6.82	45.0	83.66 ± 17.04
Overall	(33 – 165)	67.0 – 165.0	142.38 ± 20.79	148.0	82.86 ± 15.75

SD: Standard deviation

Table (6): Distribution of the studied samples according to level (n = 355)

	Low (<33.3%)		Moderate (33.3 – <66.7%)		High (≥66.67%)	
	No.	%	No.	%	No.	%
Equipment and display spaces	8	2.3	32	9.0	315	88.7
Museum audio and visual materials	31	8.7	24	6.8	300	84.5
Required Equipments	9	2.5	25	7.0	321	90.4
Overall	7	2.0	40	11.3	308	86.8

Table (7): Correlation between different scores (n = 355)

		Equipment and display spaces	Museum audio and visual materials	Required Equipments	Overall
Equipment and display spaces	r	1.000	0.639*	0.763*	0.896*
	p		<0.001*	<0.001*	<0.001*
Museum audio and visual materials	r		1.000	0.688*	0.879*
	p			<0.001*	<0.001*
Required Equipments	r			1.000	0.902*
	p				<0.001*
Overall	r				1.000
	p				

r: Pearson coefficient*: Statistically significant at $p \leq 0.05$

In the meantime, according to the previous tables that mediate between low (<33.3%) and High (≥66.67%) the highest item for the respondents was “Required Equipments” (90.4%) as well as the lowest item was “Equipments and display spaces” (2.3%).

Table (8): Relation between level of equipment and display spaces and demographic profile (n = 355)

Demographic profile	Level of Equipment and display spaces						χ^2	MC p
	Low (n = 8)		Moderate (n =32)		High (n =315)			
	No.	%	No.	%	No.	%		
Age (years)								
18-25	1	12.5	17	53.1	124	39.4	7.840	0.205
26-35	3	37.5	4	12.5	77	24.4		
36-45	3	37.5	5	15.6	72	22.9		
Over 45	1	12.5	6	18.8	42	13.3		
Gender								
Male	2	25.0	14	43.8	133	42.2	0.912	0.683
Female	6	75.0	18	56.3	182	57.8		
Nationality								
Middle East	0	0.0	2	6.3	94	29.8	70.941*	<0.001*
Africa	1	12.5	11	34.4	178	56.5		
Asia and the pacific	2	25.0	2	6.3	15	4.8		
Americas	2	25.0	13	40.6	6	1.9		
Europe	3	37.5	4	12.5	22	7.0		
Marital status								
Single	1	12.5	21	65.6	190	60.3	10.000*	0.027*
Married	5	62.5	6	18.8	91	28.9		
Other	2	25.0	5	15.6	34	10.8		
Education								
High school	1	12.5	13	40.6	189	60.0	17.181*	0.001*
University student	2	25.0	10	31.3	85	27.0		
Graduate	5	62.5	9	28.1	41	13.0		

 χ^2 : Chi square test

MC: Monte Carlo

p: p value for Relation between level of **Museum audio and visual materials** and demographic profile*: Statistically significant at $p \leq 0.05$

Table (9): Relation between level of museum audio and visual materials and demographic profile (n = 355)

Demographic profile	Level of Museum audio and visual materials						χ^2	p
	Low (n =31)		Moderate (n =24)		High (n =300)			
	No.	%	No.	%	No.	%		
Age (years)								
18-25	10	32.3	5	20.8	127	42.3	8.007	0.238
26-35	9	29.0	5	20.8	70	23.3		
36-45	6	19.4	9	37.5	65	21.7		
Over 45	6	19.4	5	20.8	38	12.7		
Gender								
Male	16	51.6	16	66.7	117	39.0	8.280*	0.016*
Female	15	48.4	8	33.3	183	61.0		
Nationality								
Middle East	3	9.7	1	4.2	92	30.7	164.059*	MC p <0.001*
Africa	3	9.7	0	.0	187	62.3		
Asia and the pacific	7	22.6	7	29.2	5	1.7		
Americas	11	35.5	6	25.0	4	1.3		
Europe	7	22.6	10	41.7	12	4.0		
Marital status								
Single	10	32.3	7	29.2	195	65.0	33.281*	MC p <0.001*
Married	9	29.0	11	45.8	82	27.3		
Other	12	38.7	6	25.0	23	7.7		
Education								
High school	6	19.4	6	25.0	191	63.7	71.624*	MC p <0.001*
University student / Graduate	6	19.4	5	20.8	86	28.7		
Postgraduate	19	61.3	13	54.2	23	7.7		

 χ^2 : Chi square test

MC: Monte Carlo

p: p value for Relation between level of **Museum audio and visual materials** and demographic profile*: Statistically significant at $p \leq 0.05$

Table (10): Relation between level of required equipments and demographic profile (n = 355)

Demographic profile	Level of Required Equipments						χ^2	p
	Low (n =9)		Moderate (n =25)		High (n =321)			
	No.	%	No.	%	No.	%		
Age (years)								
18-25	2	22.2	11	44.0	129	40.2	6.877	MC p= 0.294
26-35	1	11.1	4	16.0	79	24.6		
36-45	2	22.2	6	24.0	72	22.4		
Over 45	4	44.4	4	16.0	41	12.8		
Gender								
Male	5	55.6	11	44.0	133	41.4	0.762	0.683
Female	4	44.4	14	56.0	188	58.6		
Nationality								
Middle East	0	0.0	2	8.0	94	29.3	73.953*	MC p <0.001*
Africa	1	11.1	5	20.0	184	57.3		
Asia and the pacific	0	0.0	6	24.0	13	4.0		
Americas	5	55.6	8	32.0	8	2.5		
Europe	3	33.3	4	16.0	22	6.9		
Marital status								
Single	2	22.2	13	52.0	197	61.4	8.121	MC p= 0.062
Married	5	55.6	7	28.0	90	28.0		
Other	2	22.2	5	20.0	34	10.6		
Education								
High school	1	11.1	8	32.0	194	60.4	30.671*	MC p <0.001*
University student /	4	44.4	4	16.0	89	27.7		
Graduate	4	44.4	13	52.0	38	11.8		

 χ^2 : Chi square test

MC: Monte Carlo

p: p value for Relation between level of **Required Equipments and** demographic profile*: Statistically significant at $p \leq 0.05$

Table (11): Relation between level of overall and demographic profile (n = 355)

Demographic profile	Level of overall						χ^2	MC p
	Low (n = 7)		Moderate (n = 40)		High (n = 308)			
	No.	%	No.	%	No.	%		
Age (years)								
18-25	3	42.9	9	22.5	130	42.2	8.008	0.184
26-35	2	28.6	10	25.0	72	23.4		
36-45	1	14.3	12	30.0	67	21.8		
Over 45	1	14.3	9	22.5	39	12.7		
Gender								
Male	3	42.9	18	45.0	128	41.6	0.278	0.923
Female	4	57.1	22	55.0	180	58.4		
Nationality								
Middle East	0	0.0	3	7.5	93	30.2	137.153*	<0.001*
Africa	0	0.0	4	10.0	186	60.4		
Asia and the pacific	0	0.0	13	32.5	6	1.9		
Americas	3	42.9	14	35.0	4	1.3		
Europe	4	57.1	6	15.0	19	6.2		
Marital status								
Single	2	28.6	12	30.0	198	64.3	27.103*	<0.001*
Married	2	28.6	16	40.0	84	27.3		
Other	3	42.9	12	30.0	26	8.4		
Education								
High school	1	14.3	8	20.0	194	63.0	65.099*	<0.001*
University student / Graduate	3	42.9	7	17.5	87	28.2		
Postgraduate	3	42.9	25	62.5	27	8.8		

 χ^2 : Chi square test

MC: Monte Carlo

p: p value for Relation between level of overall and demographic profile

*: Statistically significant at $p \leq 0.05$

According to the previous tables of the relation between Demographic profile and level of equipment and display spaces, level of museum audio and visual materials, level of required equipments and level of overall that the highest item was (Single) and the lowest item was "Middle East".

Discussion and Conclusions

Museums must make changes to ensure that all people such as those with disabilities and over the past decade, museums have focused more on their disability access offerings with an increased focus on museum marketing.

Recommendations

- (1) The need for cooperation between the various ministries to facilitate the preparation of Egyptian museums for visits by the disabled, such as:
 - The Ministry of Information Technology to prepare websites and special technology for the disabled in Egyptian museums
 - The need for cooperation between private museums between the Ministry of Environment, such as the Museum of Wadi Al-Hitan and Climate Change, and the General Administration of Museum Education for People with Special Needs, in order to prepare museums for visits by the disabled.
 - The need for cooperation between the Ministry of Local Development and the Ministry of Antiquities in order to quickly finalize the necessary licenses for museum equipment for the disabled, such as elevators
- (2) The need for cooperation between businessmen and the Ministries of Antiquities and the Environment to provide the necessary material needs to equip museums for the disabled to visit those museums.

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الإعاقات الجسدية في مصر اليونانية الرومانية وقياس دور المتاحف الأثرية في ابتكار تكنولوجيا ذكية لخدمة السائحين من ذوي الاحتياجات الخاصة بالتطبيق على متاحف الإسكندرية والقاهرة

دعاء رجب فاضل

قسم الإرشاد السياحي – المعهد العالي للسياحة والفنادق – كينج مريوط - الإسكندرية

الملخص

معلومات المقالة

في مصر القديمة، اعتبرت الإعاقات الجسدية أو تشوهات الجسم من الصفات الإلهية الممنوحة للإنسان من قبل الآلهة. كان هناك العديد من العلاجات في مصر القديمة لمختلف الحالات، بما في ذلك العمى. تحتوي النصوص الطبية والسحرية من فترة ما قبل الأسرات على أمراض مختلفة مثل العمى.

كان لدى المصريين واليونانيين وجهات نظر مختلفة حول العمى. هناك فرق كبير مع العالم اليوناني الروماني فيما يتعلق بالإعاقات التي يتعرض لها المرء خلال حياته. أنشأ الإسكندر الأكبر طبقة جديدة من النخبة من الرجال المعاقين بوضعهم في مناصب بارزة في السلطة. خلال العصرين اليوناني والروماني كان يُعتقد أن الأطفال المعوقين غير مرغوب فيهم من قبل الآلهة وأن إعاقاتهم كانت أشكالاً من العقاب لسوء السلوك والخطيئة.

في العصر الحديث، هناك عدد لا يحصى من الطرق التي يمكن للمتاحف من خلالها تسويق نفسها للأشخاص ذوي الإعاقات، وهي عبارة عن كلام شفهي واستخدام تقنيات مختلفة مثل مواقع الويب ووسائل التواصل الاجتماعي. يمكن للأشخاص ذوي الإعاقات الآن الوصول إلى مجموعات المتحف والمعلومات من خلال التقنيات الرقمية الجديدة لترويج المتاحف لسلمهم وخدماتهم مثل النموذج للمسحوق هو نموذج أو نسخة من عمل فني يمكن لمسها لفحصه لمنح الأشخاص ذوي الإعاقات البصرية الفرصة للحصول على التعرف ولمس شيء معين والقفزات الإلكترونية تحتوي على أجهزة حساسة تنقل الإحساس الحقيقي بلمس الأشياء للشخص بالإضافة إلى توفير نقاط شحن لتحريك الكرسي المتحرك الكهربائي بالإضافة إلى منحدرات لسهولة نقل الكراسي المتحركة داخل المتاحف.

الكلمات المفتاحية

إعاقة؛ تكنولوجيا؛
إعاقة جسدية؛ للمس؛
متحف.

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