



Exploring Past, Present and Future of Orthotics and Prosthetics in Pakistan

Maria Liaquat¹, Saima Shaukat², Muhammad Naveed Babur³

¹Assistant professor, Rehabilitation Sciences Isra Institute of Rehabilitation Sciences Isra University Islamabad campus

²Mphil prosthetics and orthotics Student, Isra University Islamabad, Isra Institute of Rehabilitation Sciences Isra University Islamabad campus

³Principal Faculty of Rehabilitation Sciences Isra University Islamabad, Hyderabad & Karachi, Pakistan
Corresponding author: maria_liaquat@hotmail.com

ARTICLE INFO

Keywords:

Orthotics,
Prosthetics.

Submission:

January 13rd,
2021

Review:

June 3rd, 2021

Publish:

July 25th, 2021

ABSTRACT

This is a qualitative study to explore the perception of Orthotists and Prosthetists regarding past, present and future of their profession. The Qualitative research approach using individual interviews. Data was collected from professionals of some private and some government sector in Rawalpindi, Peshawar and Lahore during April 2019 to July 2019. The sample size was 12. A demographic questionnaire and standardized instrument from Nvivo was filled satisfying the inclusion criteria. A comprehensive audio-videography have been developed, recorded, transcribed and documented. Data was transcribed and thematic analysis along with characteristics was drawn manually. Data verification was done with the help of coders. After the extraction of data followings results are emerged. General category themes are trainings and seminars, opportunities, government setup, lack of coherence among professionals, uniform curriculum, and establishment of council, effects of earthquake, German contribution and techniques/technology. Barriers are identified at the level are lack of awareness/acknowledgement, low job opportunities, no proper workshops, poor referral system, limited resources and old technologies. It is concluded that the field of orthotics and prosthetics in Pakistan need attention in the following categories i.e. trainings and seminars, job opportunities, uniform curriculum, unity among professionals, establishment of council, acknowledgment at government level and awareness among other health professionals.

Introductions

The prosthetic and orthotics profession prosthetics and orthotics profession is involved in the manufacture and facility of orthopedic appliances for amputees (potential prosthetic users) and persons with other physical incapacities. The preponderance of developing countries has no regular prosthetic and orthotic (P&O) training. This happens in the inadequate availability of prosthetic and orthotic aids

for people with physical disadvantages. It is expected that in 2010, 30 million people in Africa, Latin America, and Asia, need assistive tools about 0.5% of the population in the emerging society (Magnuson and Ramstrand, 2009). The majority of these people could be re-established within the community they took an assistive tool to facilitate mobilization, known as a first level to retrieve fundamental rights, food, education, and income (Thomas and Thomas, 2003). The fields of orthotics and

prosthetics have always served great human necessities and have been on constant interest to the scientists and discoverers for centuries (Khasnabis, *et al.*, 2010).

Cold war conflicts during world history have occurred in remarkable mortality and morbidity, including grotesque wounds and the loss of limbs. These countless battle victims have provided the impetus for the development of substitute limb design. After World War II, the innovation of prosthetic device design become even further, after that the National Academy of Sciences founded the Artificial Limb Program (Awais *et al.*, 2012).

Based on report rates, The First World War created so many disabled bodies. In April 1915, 3000 disabled veterans had returned to Great Britain, only four months into its war. At final calculation, Britain had some 752,000 newly disabled people; Germany admitted 4 million injured and 1,537,000 with permanent disabilities, and France had more than 1 million newly disabled. Canada, fielding an approximately small unit in contrast to other belligerents, had some 70,000 disabled veterans, while the United States, even with entering the war late in 1917, estimated for approximately 200,000 (Gerber, 2012).

The causes for the loss in medical recovery help are not intuitive. Except it is suspected that a person with a disability will die as an outcome of the disability, the cost-effectiveness of recovery to the disabled self, to their family, and their society seems evident. Even the disadvantaged nations have a sufficient population of the middle class or well-off persons to both need and help medical recovery. Yet it is mostly missing (Healy *et al.*, 2018).

The absence of a path to health and recovery help, knowledge and vocation, and the high price of medical charges, restrict

the capacity of people with disabilities to fully interact in their societies. Injury restriction will reduce the reasons for disabilities and developed care and help will better the lives of people being with injury-related disabilities (HHRD, 2012).

To understand the causes why medical rehabilitation has not become a part of various healthcare systems, it is essential to look at historic, ethnic, political, and financial factors. Unluckily very few studies have been assumed in developing nations, where mobility and physical capabilities are so vital.

By the end of the year 2004, about 600 million people in the world had several types of disabilities and this number is increasing because of ageing, chronic diseases, conflicts and wars and road traffic mishaps etc. The increased rate of the disabled population is requiring great demands for rehabilitation services. Just about 80% of the disabled population belongs to developing countries; including Pakistan (Mills *et al.*, 2021).

Prosthetics-orthotics offer better than common occupational stability, as there are thousands of amputees and paralytics in the necessity of substitute limbs and supports. No acceptable means for manufacturing prostheses and orthosis in many measurements, like shoes, has been developed. Custom liting may be improved and made more efficient, as is being created now through research, but the replacement of the basis for such liting does not seem to be forthcoming. The discovery of means for resettling nerves to revitalize paralyzed limbs, or of serum for stimulating the amputee's body to grow new limbs would surely change prosthetics-orthotics as we know it now, and it would be ill-considered to say that such developments are difficult in light of some of the current research in

the configuration and role of the cell. However, prosthetics-orthotics is seemingly no more subject to outmodedness than most expert fields, and perhaps few so than many (WHO, 2010).

Then socio-demographic and epidemiological evolution in growing countries has remodeled the morbidity and death pattern among populations. This has brought non-transmittable diseases to the forefront of the healthcare delivery policy. Within this group, a disorder correlated to the nervous system constitutes a substantial proportion inducing morbidity, mortality, disability, and quality of living (Pakistan Federal Bureau of Statistic, 2010).

According to the information of World Health Organization on the occurrence of disability, about one million people in Pakistan require prosthetic or orthotic rehab services. The bigger part of such population is unable in accessing P&O services and as a result prohibiting their inclusion into the society. Allotting resources to the rehabilitation of these disabled people can make them important providers to the society. Irrespective of the incremental progressions made in the last 2 ½ decades, the bulk of the disabled population in Pakistan does not have an approach to even basic rehab services and also they are deprived of their elementary human rights (Awais et al., 2012)

Disability is a shame in Pakistan, and cultural traditions are an interruption to the integration of the disabled into society. Further limitations to addressing the necessities of the disabled include the loss of unfailing disability epidemiologic data, lacking funding and inadequate health care system, and workforce shortages (Magusson, 2009).

The requirement for a high-quality prosthetics and orthotic education program

in Pakistan is heightened by the event of disability in the country. In Pakistan, the recorded frequency of locomotors' disabilities ranges from 0.3%-0.83% (HHRD, 2012). Pakistan's repeated fight with terrorism issued a subsequent growth in the incidence of amputation. Furthermore, Pakistan is one of four nations in the world that are still polio-endemic. The majority of patients infected with polio need orthosis (Statistic Government of Pakistan, 1998). The earthquake in October 2005 produced 750 amputees at altered levels and 650 paraplegic patients within Northwest Frontier Province and the Kashmir district (Awais et al., 2012).

Pakistan's health pointers, health infrastructure and level of funding are generally underprivileged, especially in rural areas. There is no government-sponsored health insurance organization, but private health insurance is obtainable for those few who can afford it. A government employee becoming disabled during the course of work is usually allowed to a disability grant and medical benefit. Most of the population, therefore, does not have access to suitable health care (Sidra, et al., 2011).

Methods

This study was initiated after approval from advanced study & research committee (ASRC) of Isra institute of rehabilitation sciences, Isra University Islamabad. A total of 12 professionals, inclusion and exclusion criteria were recruited in the study. Researchers/ Clinicians were asked to give individual interviews one to one. In the interviews, questions were asked from a self-structured questionnaire. The informed consent was taken prior to collection of data. The data was analyzed through N Vivo software.

S#	Theme	Characteristics
1	Trainings and Seminars	Professional enhancements, development of knowledge regarding advancements in the field, Exposure to different approaches, Organization should bear the cost, trainers are not available so foreigner trainers should be needed
2	Opportunities	Jobs opportunities are rare and really difficult to find a good opportunity. No suitable salaries
3	Government Setup	Few government setups with lack of advanced workshops. No acknowledgement. Low awareness in the public sector
4	Lack of Coherence among professionals	No unity, no common platform, very slow advancements. Because of this more quacks being benefited
5	Uniform curriculum	Lack of uniform curriculum which leads to groups of P n O's with different school of thought. No accurate balance among theory and practical skills learning
6	Establishment of Council	For the steady growth and improvement in the field, establishment of council is very compulsory which is still in process. Due to its absence the development was very slow almost stagnant
7	Effects of Earthquake	Many institutes initiated this course after the Earthquake in 2005. A lot of patients were treated and more trained P n O's were required.
8	Germans Contribution	Foreigners especially Germans played really important role in the establishment of this field in Pakistan as they came to treat Afghan war refugees and trained the locals the basic skills.
9	Techniques/ technology	ICRC Polypropylene technology is mainly used for prosthesis.

Results

Barriers	
1	There are no job opportunities in the government sector.
2	In private sector there is no fixed salary so P n O's are being exploited
3	There is lack of government set ups.
4	No awareness or acknowledgement in the government sector
5	P n O's are not being acknowledged like other health professional i.e. physiotherapists
6	Lack of proper workshops
7	There is no unity among the professionals
8	Absence of council leads to many different school of thoughts which create problems for P n O's to work together
9	No proper referral system
10	Very old techniques and technologies are used in this field. Because of low budget and limited resources.
11	Low awareness among the other health professionals
12	Evolution of this field is slow almost stagnant because of advancements and improvements in the education system
13	Most of the teachers who are teaching BS (hons) P n O, are only bachelor's degree. Only one university is offering Master's degree
14	There are no known NGO's who financial support the treat of this field and health insurance doesn't include prosthetics treatment.
15	Very limited resources. Low funding's
16	There is lack of uniform curriculum. Present curriculum is not according to the international standards.
17	There is unequal distribution of syllabus between practical skills and theory.
18	There is no check and balance from any authority
19	Lack of quality education
20	Faculty in most of the institutes is not qualified up to the international level

Discussion

The importance of trainings and seminars cannot be denied. Trainings should be conducted on the regular intervals by different organizations and not only one or two organization can be responsible for conducting the trainings. Every institute should conduct the trainings for their workers and should send them for the trainings on regular basis. It will be really helpful for the growth and development of the institute as it will help their workers to get the exposure of different approaches being used in the field of orthotics and prosthetics not only in Pakistan but all over the world. It is the responsibility of the institute to bear the expenditure for the trainings and seminars. In the long run the expenditure will serve them back.

Job opportunities in the field of orthotics and prosthetics are really low. Unemployment can cause depression in the young lot of the society which can be harmful on the national level. This field couldn't get the acknowledgement until and unless if every government set up has orthotics and prosthetics department with orthopedic department. There should be separate OPD's where P n O's can examine the patients.

The main reason due to which this field is not flourishing the way it should be is the lack of coherence among the professionals. The pioneers and experienced people of this field see each other as the competitor rather than a coworker. This is due to lesser interactions among them. If they are in contact with professionals of their own field then they can get the useful ideas by discussing with each other. Because of no unity among the professionals many quacks are getting benefited.

The following quote is taken from the

post conference document of the ISPO Conference held in Dortmund, Germany, 2004. "It was obvious early in the conference and from the survey returns that a countless deal of resemblances exist between prosthetic and orthotic practitioners both in terms of professional capabilities and educational needs. These resemblances directed that these professionals work in a recognized and distinct way in supplying prosthetic and orthotic care to patients in many countries in Europe and thus should be recognized as one professional group, known as Prosthetists and Orthotists. Although a number of variances in models and trails of education existed between the countries represented, ambassadors agreed upon the need for a common set of standards of education and learning objectives for student Prosthetists and Orthotists in Europe. This was perceived as important in confirming appropriate care for persons using prosthetic and orthotic devices (Magnusson et al., 2016).

For the betterment of this field in Pakistan we need to establish a council of orthotics and prosthetics like any other discipline of medical field. Under the council P n O's can work together for the development of the field. There is no proper platform which can work for the development and betterment of the field. The establishment of council can provide a place to P n O's where they can ask for help in any kind of difficulties.

The earthquake of 2005 was a turning point in the establishment of orthotics and prosthetics in Pakistan. Before the earthquake there were not enough employment opportunities and awareness for all the qualified P&Os and the field.

The October 2005 earthquake was the most damaging natural disaster in the

country's past in terms of the number of people killed or injured. There were numerous survivors with extreme disabilities, such as spinal cord injury, traumatic brain injury, amputation, and long bone fractures. Their management and recovery involved rehabilitation doctors, mainly from the armed forces (Rom & Kelman, 2020).

Germans played a very vital role in the history of orthotics and prosthetics in Pakistan. They initiated this field in Pakistan. They started treating the refugees of the Afghan war. They trained the locals to be skillful to deal the patients when they are gone. In the beginning the PIPOS started this course and they hired teachers mainly from Germans who had graduation degree in the relevant field

The main problem we face in practical aspect of this field is not the technical skills but the advancements in technology. The lack of updated knowledge abstain us from developing new methods which can preserve not only P n O's energy but also benefit the patients both financially and physically. We should not only focus on enhancing the technical skills but also advanced technology. By every passing day there is a new discovering in the field of orthotics and prosthetics, but unfortunately most of the P n O's are still using the techniques which were being taught in the beginning of this field.

Conclusion

D From the perspective of participants it was concluded that the up gradation and upkeep of this field is very necessary for the betterment and development.

Mostly participants had issues regarding the job opportunities they think that it is necessary for every government hospital to

have orthotics and prosthetics department. Government needs to understand the importance of this field in the rehabilitation. There are not enough jobs for the fresh graduates, so this field is getting saturated with unemployed P n O's.

There are no proper trainings arranged by the institutes to enhance the abilities of P n O's. Old technology and old techniques are still in use even in much known rehabilitation institutes.

Another factor which was concluded by this research was that the participants were not satisfied by the unity of the professional in their field. They felt an immense need of a platform where they can get together to understand the problems of other P n O's. If they could get a proper platform where they can get their rights then will try to come united. Unity is the basic problem which is being faced in our field. We need to understand that sharing the knowledge and making collaboration is very necessary for the development of this.

It was further concluded by interviews of the participants that there is no uniform curriculum which is the basic need to provide good education and give a good base to the P n O's. By setting a uniform curriculum we can solve many problems.

Recommendations

Every government hospital has the department of Orthotics and prosthetics. Government setups should provide jobs to the fresh graduates. By making new set up on the government level will definitely overcome the problem job opportunities and it will also lesser the load of the patients.

Proper trainings and seminars should be arranged to overcome the lacking of up to date knowledge. Trainings can be arranged

in the country by appointing foreigner trainer to conduct it for our P n O's in such a way we can train more P n O's . Every institute should take this initiative to send their P n O's to the developed countries for the trainings and exposure to the advanced knowledge. There should be a uniform curriculum according to ISPO professional profile. Establishment of council is really compulsory for the betterment of field. Orthotics and prosthetics schools should implement a professional advisory system. They should have a member of the disabled community on advisory

References

- Federal Bureau of Statistics, 2010. *Social Statistics: Health Statistics: Health Institutions Beds And Personnel*. Available at: http://www.statpak.gov.pk/depts/fbs/statistics/social_statistics/health2.pdf May 18, 2010.
- Helping Hand for Relief and Development. 2012. *Persons With Disabilities (Pwds) Statistics In Pakistan, Islamabad*. HHRD 112 p. ISBN 978 969 9831 00 3.
- Khasnabis C, Heinicke Motsch K, Achu K, et al., 2010, Geneva: World Health Organization
- Magnusson, L., Ramstrand, N., 2009. Prosthetist/Orthotist Educational Experience & Professional Development in Pakistan. *Disability and Rehabilitation: Assistive Technology*, 4(6): 385-392
- Pakistan Population; 2016 Dec 27 [cited 2016 Dec 27]. Available from: www.worldometers.info/world-population/pakistan-population
- Sidra, Shabbir., Shabana, Jamal., Israr, Ahmed., Zainab, Mahsal., Khan, Tanwir Khaliq. 2011. Outcome of Vascular Trauma at Pakistan Institute of Medical Sciences, Islamabad. *Ann. Pak. Inst. Med. Sci* 7(1): 29-32.
- World Health Organization. Pakistan, statistics. 2010. Available at: <http://www.who.int/countries/pak/en/>. Accessed May 18, 2010.
- Awais, S. M., Dar, U. Z., & Saeed, A. (2012). Amputations of limbs during the 2005 earthquake in Pakistan: a firsthand experience of the author. *International Orthopaedics*, 36(11), 2323–2326. <https://doi.org/10.1007/s00264-012-1589-3>
- Healy, A., Farmer, S., Pandyan, A., & Chockalingam, N. (2018). A systematic review of randomised controlled trials assessing effectiveness of prosthetic and orthotic interventions. *PloS One*, 13(3), e0192094–e0192094. <https://doi.org/10.1371/journal.pone.0192094>
- Magnusson, L., Shangali, H. G., & Ahlström, G. (2016). Graduates' perceptions of prosthetic and orthotic education and clinical practice in Tanzania and Malawi. *African Journal of Disability*, 5(1), 142. <https://doi.org/10.4102/ajod.v5i1.142>
- Mills, J.-A., Cieza, A., Short, S. D., & Middleton, J. W. (2021). Development and Validation of the WHO Rehabilitation Competency Framework: A Mixed Methods Study. *Archives of Physical Medicine and Rehabilitation*, 102(6), 1113–1123. <https://doi.org/10.1016/j.apmr.2020.10.129>
- Rom, A., & Kelman, I. (2020). Search without rescue? Evaluating the international search and rescue response to earthquake disasters. *BMJ Global Health*, 5(12), e002398. <https://doi.org/10.1136/bmjgh-2020-002398>