



## Knowledge and Attitude on Prosthetics and Orthotics among Undergraduate Medical Students in a Private Medical College in Kancheepuram District

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### ABSTRACT

**Background:** Prosthetics and orthotics is the umbrella term for the science, technology, education and application of orthoses and prostheses. Prosthetics is a speciality in the medical field comprising of research, development, design, manufacture and application of prostheses. Orthotics is a speciality in the medical field comprising of research, development, design, manufacture and application of orthoses.

**Methodology:** A cross sectional study with convenient sampling was done from a medical institute of Kancheepuram district. Data collected included age, gender, year of study and basic questions on prosthetics and orthotics. A structured questionnaire was used for data collection.

**Results:** Among the study participants majority were aged below 20 years. Around 26.1% of the study participants had awareness about orthotics & prosthetics and 45.9% were able to distinguish orthotics & prosthetics as different areas of expertise. 40.1% of students expressed

interest in studying prosthetics and orthotics as part of their curriculum and 38.1% think it has scope in India.

**Conclusion:** Population expansion, an ageing population, an increased incidence of accidents, and other issues may result in greater need for prosthetic and orthotic services in the future.

Prosthetic and orthotic rehabilitation must be promoted at the grassroots level in order to improve accessibility to persons in need. Better Prosthetic and Orthotic rehabilitation treatments can help to minimize health-care costs. Furthermore, greater activity may improve users' quality of life.

**Keywords:** Medical device, academics, rehabilitation, quality of life

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## **BACKGROUND:**

To access and enjoy equal opportunity, education, or citizenship mobility is the first condition. Assistive devices like prosthesis, orthosis, and mobility aids play a crucial role in transforming differently-abled and make them mobile<sup>1</sup> Prosthetics and orthotics are two closely related fields of healthcare that deal with designing, fitting, and providing medical devices to help individuals with physical disabilities or impairments to achieve greater mobility and function.

Prosthetics refer to the creation and fitting of artificial limbs and body parts for individuals who have lost their limbs due to injury, disease or other reasons. These devices, also known as prostheses, can range from basic, functional limbs to highly advanced devices that incorporate advanced electronics and computer control.

Orthotics, on the other hand, are medical devices designed to support or correct a part of the body, typically the limbs or spine, that is either injured, weakened or deformed. Examples of orthotics include braces, splints, and other supportive devices that can help people manage chronic conditions like scoliosis, cerebral palsy, or spinal cord injuries.

Prosthetics and orthotics are both important in helping individuals with physical disabilities to lead more active and independent lives. Professionals in these fields, known as prosthetists and orthotists, work closely with patients to evaluate their needs and goals, design and create customized devices, and provide ongoing care and support to ensure that the devices are functioning properly and meeting the patients' needs.<sup>2</sup>

Orthotics and prosthetics are critical components in the healthcare system as they can help individuals with physical impairments improve their quality of life and increase their independence. These devices can help reduce pain, prevent further injury, improve posture and gait, and increase mobility, making it easier for individuals to perform daily activities and participate in physical activities.

In addition to improving quality of life, orthotics and prosthetics can also play a role in reducing the need for additional surgeries, rehabilitation, or medical procedures. By providing support and stability to the musculoskeletal system, orthotics can help prevent further injury and reduce the need for medical intervention. Similarly, prosthetics can help individuals with missing limbs or body parts regain independence and reduce the need for additional medical procedures or surgeries.

About 1.5% of the world's population requires prosthetic and orthotic therapies. Furthermore, only 5-15 percent of the population (one out of every ten people) has access to prosthetic and orthotic devices. Despite the passage of disability acts and increased awareness to enhance function and quality of life among prosthetic and orthotic users, the attitudes of the government and society toward their participation are of primary concern.<sup>3,4</sup>

Despite their importance, there is a growing concern about the level of knowledge and attitudes of medical students towards orthotics and prosthetics. Understanding the knowledge and attitudes of medical students is essential because they are the future providers of care to patients who may require these devices. As such, it is imperative to assess the level of knowledge and attitudes of medical students towards orthotics and prosthetics in order to identify areas for improvement and ensure that they are equipped with the necessary skills to provide the best possible care to their patients.

Medical sciences have an impact on people's health, therefore it's important to consider all risks, possibilities, and problems when making decisions and planning, especially in the area of education. Due to its preventive nature, the orthotics and prosthetics field of research is extremely important in comparison to other rehabilitation disciplines<sup>5</sup>. They should also be aware of how much their role as a member of the health team can influence various parts of people's life. This study aims to assess the knowledge and attitude among undergraduate medical students on prosthetics and orthotics as a course and to justify its importance of being included in medical curriculum.

## **METHODOLOGY**

A descriptive cross-sectional study was conducted among students from a Private medical college, Kancheepuram district, Tamil Nadu. Responses from 436 students was collected through purposive sampling method. Sampling frame included undergraduate medical students from 2<sup>nd</sup> year till final year MBBS. Sample size was calculated through Dobson's formula. All those who gave consent were included in the study. Students who did not give consent and those belonging to first year were excluded. The study was carried over a period 3 months from July 2022 to August 2022.

**Data collection Tool:** Data was collected from eligible and willing participants who were personally interviewed using a semi structured questionnaire which was prepared after a rigorous pilot testing with questions related to socio demographic details, details of their education, and information regarding the knowledge, attitude and behaviour towards prosthetics and orthotics. The pilot study was done, and questionnaire was tested among 30 participants. The questionnaire which was developed and tested was used for collecting data in the present study.

**Data Analysis:** Data was entered in Microsoft excel sheet and analysed using SPSS 22.0 version using descriptive statistics. The outcome variables of the study are all categorical variables and expressed as proportions.

**Ethical clearance and informed consent:** The study was approved by the ethics committee of Sree Balaji Medical college & Hospital, Chrompet. The participants were briefed about the

purpose of the study and informed consent was obtained from each participant before the interview.

### RESULTS:

The study done to assess the knowledge, attitude on prosthetics and orthotics among undergraduate medical students. Out of all participants (n=436), 223(51.5%) were aged below 20 years and around 213(48.9) were aged above 20 years. Female participants were predominantly higher 261(59.9), when compared with males 175(40.1). Around 185(42.4%) were 2<sup>nd</sup> year undergraduate students and 46(10.6%) were medical interns. (Table.1)

**Table.1 Socio-demographic details of study participants**

S.NO	Variable	Frequency (N)	Percentage (%)
1.	<b>Age</b>		
	<20 years	223	51.1
	>20 years	213	48.9
2.	<b>Sex</b>		
	Male	175	40.1
	Female	261	59.9
3.	<b>Year of study</b>		
	2 <sup>nd</sup> year MBBS	185	42.4
	3 <sup>rd</sup> year MBBS	142	32.6
	Final year MBBS	63	14.4
	Interns	46	10.6

**Table 2: Knowledge about orthotics & prosthetics among study participants**

S.NO	Variable	Frequency (N)	Percentage (%)
1.	<b>Aware about a course in prosthetics &amp; orthotics while joining undergraduation</b>		
	Yes	114	26.1
	No	246	56.4

	Not sure	76	17.4
2.	<b>Are prosthetics &amp; orthotics one and the same</b>		
	Yes	49	11.2
	No	200	45.9
	Not sure	187	42.9
3.	<b>How to address a person specialized in prosthetics &amp; orthotics</b>		
	Physiotherapist	17	3.9
	Orthopaedician	30	6.9
	Physiatrist (PMR)	21	4.8
	Prosthetist & orthotist	225	51.6
	Not sure	143	32.8
4.	<b>How is prosthetics and orthotics course available in India?</b>		
	Undergraduate medical	86	19.7
	Undergraduate allied health sciences	119	27.3
	Postgraduate medical	104	23.9
	Postgraduate allied health sciences	44	10.1
	Undergraduate diploma	48	11
	Postgraduate diploma	35	8
5.	<b>Under which specialty do they work?</b>		
	Surgery	16	3.7
	Orthopaedics	65	14.9
	Podiatrist	13	3.0
	Physical medicine and rehabilitation	56	12.8
	All the above	148	33.9
	Not sure	138	31.7
6.	<b>In which clinical setting do you think a prosthetist and orthotist practice?</b>		

	Individual clinic	16	6.7
	Under Hospital	65	30.7
	Under a rehabilitation center	13	27.8
	Not sure	56	34.9
7.	<b>Who require their services?</b>		
	children	10	2.3
	adults	26	6.0
	old age	45	10.3
	all the above	355	81.4
8.	<b>Can patients of all ages consult a prosthetist &amp; orthotist?</b>		
	yes	222	50.9
	no	34	7.8
	not sure	180	41.3
9.	<b>Do you think you need a referral from your doctor to see a prosthetist &amp; orthotist?</b>		
	yes	203	46.6
	no	56	12.8
	not sure	177	40.6
10.	<b>Is there a difference between a orthotist, orthodontist and an orthopaedician?</b>		
	yes	269	61.7
	no	28	6.4
	not sure	139	31.9
11.	<b>Do you think prosthetic &amp; orthotic devices can be given only by prosthetist &amp; orthotist?</b>		
	yes	196	45.0
	no	73	16.7
	not sure	167	38.3

**Knowledge about orthotics & prosthetics among study participants:** It was found that only 26.1% were aware about a course on prosthetics and orthotics and the rest were either unaware or were unsure about such a course. Around 45.9% said orthotics & prosthetics are different

areas of expertise and 51.6% had knowledge on how to address them. 27.3% of the students answered orthotics & prosthetics as an undergraduate allied health science course. Around 33.9% of the study participants had an idea that O & P specialists worked under all specialties of surgery, orthopedics, podiatrist and physical medicine and rehabilitation and 31.7% were unsure under which specialty they group into. Among the study participants 61.7% knew the distinction between an orthotist, orthodontist, and orthopaedician. 46.6% of the sample population perceived that a referral was required to see an O&P expert, and 34.9% were unsure of the clinical setting they practiced in. (Table.2)

**Table 3: Attitude about orthotics & prosthetics among study participants**

S.NO	Variable	Frequency (N)	Percentage (%)
1.	<b>Do you think UG curriculum should have contents on prosthetics and orthotics</b>		
	Yes	175	40.1
	No	51	11.7
	Maybe	210	48.2
2.	<b>Do you agree that every multi-specialty hospital should have a prosthetist &amp; orthotist?</b>		
	Yes	331	75.9
	No	105	24.1
3.	<b>Do you think prosthesis &amp; orthosis can improve the quality of life of patients?</b>		
	Yes	385	88.3
	No	51	11.7
4.	<b>Do you think prosthetics &amp; orthotics as a course has scope in your country?</b>		
	Yes	166	38.1
	No	225	51.6
	Not sure	45	10.3

**Attitude about orthotics & prosthetics among study participants:** Around 40.1% of the study population said that UG curriculum should contents on orthotics & prosthetics. 75.9% believe that prosthetists and orthotists should work in every multi-specialty hospital. About 88.3% think prosthesis & orthosis can improve quality of life of patients and 38.1% think there is scope for this specialty in India

## **DISCUSSION:**

The field of orthotics and prosthetics is gaining increasing popularity in recent years owing to the largely increasing geriatric population and higher incidence of accidents<sup>6</sup>. Hence to compensate for this increasing demand, more emphasis has to be laid on the awareness on this field, particularly among the students pursuing health care courses. The study yielded interesting findings which are discussed below compared with studies done in India and elsewhere.

The findings of this study showed that 26.1% of medical students were aware of prosthetics & orthotics as an undergraduate course and around 45.9% were able to distinguish between the two fields. In a study done by Aminian G et al showed that medical students had limited knowledge of orthotics and prosthetics and limited exposure to the use of these devices in clinical practice<sup>7</sup>. Similar findings were present in a study done by Lusardi et al which showed that entry level health professional education had limited exposure to orthotics and prosthetics in their clinical training<sup>8</sup>. In a study done by Alshammari, K et al it was found that medical students had limited knowledge of the indications, components, and applications of orthotics and prosthetics<sup>9</sup>. These findings highlight the lack of knowledge and awareness about orthotics and prosthetics among the medical students. Therefore, medical schools should incorporate more education and hands-on training in orthotics and prosthetics into their curricula to improve students' knowledge and ability to provide appropriate referrals for these devices.

In the present study students expressed a relatively high interest in prosthetics & orthotics 40% to be part of their curriculum studies and around 38.1% think it has scope in India. They expressed interest in the course for learning but there was no positive attitude towards taking it up as a profession. A vast number of students agreed this branch can improve the quality of life of the patients and they should be mandatorily present in every multi-speciality hospital<sup>10</sup>.

Similar findings were observed by Wong M S et al which revealed positive attitude towards orthotics and prosthetics among medical students, but this attitude was influenced by the amount of education and exposure they received in these fields<sup>11</sup>.

Findings from a study conducted by Magnusson L, et al<sup>12</sup> showed that medical students had a limited understanding of orthotics and prosthetics, and that this limited understanding was reflected in their negative attitudes towards these devices. Thus, by incorporating more education and exposure to orthotics and prosthetics into the medical curriculum would result in improvement of medical students' attitudes towards these fields.

In India, there is a growing demand for professionals in the field of orthotics and prosthetics. The increasing prevalence of physical impairments and disabilities, along with the growing awareness of the benefits of orthotics and prosthetics, has created a need for highly skilled and trained professionals in this field<sup>13</sup>.

In addition to their importance in the rehabilitation of patients, orthotics and prosthetics are also rapidly evolving fields. With advancements in technology and materials, these devices are becoming more sophisticated and effective in helping patients regain their mobility and independence. It is crucial for medical students to stay up to date with these advancements in order to provide the best possible care to their patients.



Furthermore, orthotics and prosthetics can also improve overall efficiency in the healthcare system by reducing healthcare costs and improving patient outcomes. By providing individuals with physical impairments the support they need to lead more active and independent lives, orthotics and prosthetics can help reduce the need for ongoing medical intervention and increase overall efficiency in the healthcare system<sup>14</sup>.

### **CONCLUSION:**

The findings of the study highlight the fact that, majority of the students expressed decreased awareness about a course on orthotics & prosthetics. Student's attitude towards orthotics & prosthetics was both positive and negative. They expressed interest in the course for learning but there was no positive attitude towards taking it up as a profession. Population expansion, an ageing population, an increased incidence of accidents, and other issues may result in greater need for prosthetic and orthotic services in the future. With proper awareness about the course and guidance the future generation of healthcare professionals will consider prosthetics & orthotics branch as a potential career choice for them. Overall, orthotics and prosthetics play a crucial role in healthcare by improving quality of life, reducing the need for medical intervention, and improving overall efficiency in the healthcare system.

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**CONFLICT OF INTEREST:** None declared.

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