

in the treatment of acute injuries that consistently cause late hand deformities. It was believed to have started with World War II victims. There has been a push on how to handle hand issues and a better understanding.^{1,2}

Hand surgery, as a specialized field, depends on general practitioners to diagnose and refer patients³. Hand surgery, which is at the intersection of plastic, orthopaedic, and microsurgery, has recently become a field of study since treating hand injuries and infections requires expert surgeons trained in certain procedures⁴. For treating a variety of hand problems, given that hand therapy is crucial, a hand therapist spends more time with patients than a surgeon⁵.

Upper limb surgery and hand surgery are two of the most difficult subspecialties within orthopaedic and plastic surgery. It takes a profound and exceptional skill to detect and treat the many disorders that can harm the hand and grasp of the hand's natural structure as well as in correctly in order to guide our patients toward recovering their function. To be successful, a hand surgeon needs to be unique in a few ways: they must possess the best level of technical precision, an innate artistic ability, good surgical skills, be imaginative and creative knowledge of hand anatomy in order to perform and design new procedures, pay close attention to every detail, and be delicate enough with the various hand tissues⁶.

The area of hand surgery has advanced to the point that many experts have a deep passion for specific subspecialties, such as microsurgery (including functional muscle transfers), brachial plexus surgery, cancer, or wrist surgery. The skill of the hand surgeon is required to manage many hand conditions, such as severe hand infections, difficult reconstructive hand surgeries, complex congenital hand abnormalities, mutilating hand injuries, wrist pathology, microsurgery, joint replacements, malignant tumours, and brachial plexus/peripheral nerve injuries. As a matter of fact, prominent centres for these subspecialties of hand surgery are currently in operation⁷. Our aims of the study are to assess the general public's knowledge and awareness of hand surgery and determine which specialty they associate hand surgery with the most.

METHODS

In our cross-sectional study the authors have designed a self-administered questionnaire after analysing existing literature with similar goals. An orthopaedic surgery expert revised and created the questionnaire to verify the questions' objectivity.

The validation of the questionnaire was done by a pilot study consisting of 12 diverse participants and was modified accordingly. Apart from demographic questions, the questionnaire included 13 questions about participants' knowledge of deciding between a plastic and orthopaedic clinic for a patient with a hand injury¹². To the following criteria, participant knowledge calculation was done; out of 13 questions in our study, 8 of them had only one possible answer, depending on the participant's opinion. The participant who answered three or fewer were considered unknowledgeable, whereas four out of eight were considered good knowledge¹².

After institutional ethical committee review and approval, the survey was distributed using an online questionnaire that is collected through social media for adults in India. All subjects have been informed that no identifiers are needed. Data was protected, and only authorized people had access to it. Google Forms was used for the survey. Subjects were asked to complete the survey between April 21 and June 23, 2022. The inclusion criterion was who accepted to participate and was 18 years old or older living in India. People who did not prefer to complete the survey outside India were excluded.

Statistical Analysis

For the study's statistical analysis, SPSS (Statistical Package for Social Sciences) version 28 was used. The sample size was calculated with a 95% confidence level and a 5% margin of error for the study, revealing a required sample of 385. The data analysis was done using descriptive data analysis, and a *p*-value of 0.05 was considered the cut-off point for the significance level.

RESULTS

Table 1 shows that 1432 participants responded and were involved in this study. More than half of the participants were between 21 and 30 years of age (*n*=768; 53.63%). Most participants were female (*n*= 834; 58.24%), while 12.29, 13.26, and 12.84% of patients were aged between 18 and 20, 31 and 40; 41 and 50, years respectively. Only 6.60 and 1.40% of the participants were aged between 51-60 and 61-70 years respectively. In terms of education, 24.86% had high school diplomas, and more than two-thirds (63.82%) of patients had bachelor's degrees, followed by 7.40% with higher education, and only 0.69% and primary school and 3.20% in middle school, respectively. About 23.74% of them were from the northern part, while 25.69% of the participants were from the western region,

followed by 22.48% of participants from the eastern region, and only 11.31% and 16.75% were from the central and southern areas, respectively. The 24.16% who were employed and the majority of study respondents (27.93%) were students, followed by 23.18% who were health studies students, 6.56 and 6% who were retired or healthcare practitioners, and 12.15% who were unemployed respectively.

Table 1: The sociodemographic characteristics of our study participant

Sociodemographic characteristics	n	%
Age		
18-20	176	12.29
21-30	768	53.63
31-40	190	13.26
41-50	184	12.84
51-60	94	6.56
61-70	20	1.39
Education level		
Primary school	10	0.698
Middle school	46	3.20
High school	356	24.86
Bachelor degree	914	63.82
Higher education	106	7.40
Gender		
Male	598	41.75
Female	834	58.24
Residential area		
Northern region	340	23.74
Western region	368	25.69
Eastern region	322	22.48
Southern region	240	16.75
Central region	162	11.31
Employment status		
Employed	346	24.16
Unemployed	174	12.15
Student	400	27.93
Health studies student	332	23.18
Healthcare practitioner	86	6.00
Retired	94	6.56

In comparison to 47.5% who had poor knowledge, approximately more than one-half of the general population had enough knowledge regarding choosing a suitable clinic for a patient with a hand injury (52.5%).

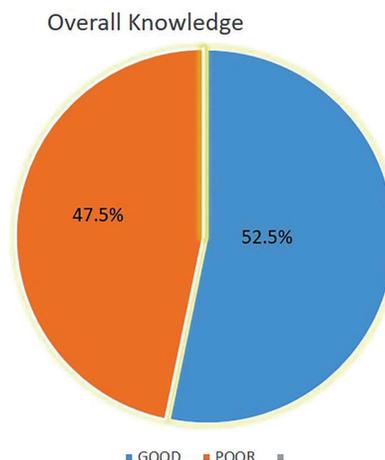


Fig. 1: Knowledge in general society regarding choosing a suitable clinic for a patient with a hand injury

While choosing a suitable clinic for a patient with a hand injury, *Table 2* provides the results of knowledge regarding it. The 34.35% participant knew that a plastic surgeon is a qualified specialist when they were asked about the appropriate clinic for someone born with a congenital hand anomaly. 12.70% of participants said they would visit a general surgeon. Approximately half of them said they would go to an orthopaedic surgeon (44.61%), and only 8.37% said they did not know.

When asked about the surgeon who will perform replantation or repair when someone’s finger gets amputated or deeply cut, most of them were aware that they should consult a plastic surgeon (45.60%), followed by an orthopedic surgeon (38%), and less frequently, a general surgeon (1.82%), while 5.7% were not aware and they did not know. About 44.6% believed that orthopedic surgeons are qualified to perform reconstruction and specialize in hand surgery, while one-fifth did not, and 28.30% did not know. When asked if plastic surgeons are skilled in hand reconstruction surgeries, 45.60% are aware that they are, while 29.20% said they did not know about their skills.

The last reported question and its answer was “I don’t know” (29.20%). Most participants felt safer having hand surgery performed by an orthopedic surgeon (54.90%), 33% were comfortable with both surgeons, and only 13.12% were indecisive and did not feel that way. Most of them were unaware and stated that they are unconcerned about having

hand surgery performed by a plastic surgeon (38.12%), approximately 1/3 felt safer (32.90%), and 28.38% did not think that they should go to a plastic surgeon. When asked about specialties and multiple-choice questions that can perform hand surgery, 75.5 and 59.2% had good knowledge, respectively, and they answered plastic surgery and orthopedics. Trauma surgery (33%), followed by general surgery (31%). Only 32.10% knew that not all orthopedic surgeons could perform hand surgery. Neurosurgery was mentioned by 45.33% of respondents, and. About 46.4% believed that all of them were qualified for that, and 21.30% said they were not aware of these.

Table 2: Knowledge with respect to choosing a suitable clinic for a patient with hand injury

Variables	n	%
1. When someone is born with a congenital hand anomaly, they will go to		
Orthopedic surgeon	638	44.61
Plastic surgeon	492	34.35
General surgeon	182	12.70
I don't know	120	8.37
2. When someone's finger gets amputated or deeply cut, the following doctor will perform reconstruction.		
Plastic surgeon	638	44.55
Orthopedic surgeon	558	38.96
General surgeon	156	10.89
I don't know	80	5.58
3. Orthopedic surgeons who specialize in hand surgery aren't qualified for performing reconstruction.		
True	358	25.0
False	652	45.53
I don't know	420	29.32
4. Plastic surgeons aren't qualified for performing hand reconstruction surgeries.		
True	404	28.21
False	638	44.55
I don't know	390	27.23
5. I feel safer having my hand surgery performed by an orthopedic surgeon.		
True	786	54.88
False	188	13.12
Indifferent	458	31.98
6. I feel safer having my hand surgery performed by a plastic surgeon.		
True	480	33.52

Variables	n	%
False	406	28.35
Indifferent	546	38.12
7. Hand surgery can be performed by which of the following specialties (multiple choices)?		
Plastic surgery	848	59.21
Orthopedic surgery	1066	74.44
Neurosurgery	660	46.08
General surgery	458	31.98
Trauma surgery	458	31.98
8. All orthopaedic surgeons can perform hand surgery.		
True	660	46.08
False	452	31.56
I don't know	320	22.34
9. All plastic surgeons can perform hand surgery.		
True	350	24.44
False	686	47.90
I don't know	396	27.65
10. When someone gets a severe burn in their hand, they go for follow-up to		
Plastic surgeon	1086	75.83
Orthopedic surgeon	72	5.02
General surgeon	218	15.22
I don't know	56	3.91
11. When someone needs joint replacement in the wrist, they go to		
Plastic surgeon	196	13.68
Orthopaedic surgeon	1106	77.23
General surgeon	80	5.58
I don't know	50	3.49
12. Is the complication rate lowered when an orthopedic surgeon performs a hand surgery rather than a plastic surgeon?		
Yes	540	37.70
No	280	19.55
I don't know	612	42.73
13. Does a patient have the right to choose what specialty to go for hand surgery? (Orthopaedics or plastics surgeon)		
Yes	644	44.97
No	314	21.92
I don't know	474	33.10

About 24.4% of the participants knew that all plastic surgeons could perform hand surgery,

whereas most thought the opposite, and 27.7% were not aware of it. Most participants stated that they would go for a follow-up with a plastic surgeon if they got a severe burn injury on their hand (75.8%). Only 5% said they would go to an orthopedic surgeon, whereas 15.2% of them mentioned that they would visit a general surgeon, and 3.9% said they did not know whom to consult. When asked about joint replacement of the wrist and the best surgeon for that, the majority (77.2%) were aware that they had to go to an orthopedic surgeon, followed by a plastic surgeon (13.7%), and only 5.6%) thought they should consult a general surgeon, and 3.5% said they did not know whom to consult. More than 1/3 of the participants (37.7%) believed that when hand surgery was performed by an orthopedic surgeon, the complications rate was lower than performed by a plastic surgeon; 19.6% knew it was not, and the majority (42.7%) had no clue.

Only 33.1% had no idea that the patient had the right to choose whether to have orthopedic, plastic, or both types of surgery. Whereas 21.9% of participants did not know, and as seen in Table.3

About 59.2% of participants with sound knowledge were female, while only 40.8% were male. More than 1/2 of the participants with poor knowledge were female (57.3%), and 42.7% were male. We compared participants' knowledge with sociodemographic data. A chi-squared test of independence showed no significant association between gender and educational status and knowledge ($p = 0.597$ and $p = 0.597$, $p = 0.115$).

Regarding the association between education level and knowledge of hand surgery, the majority of participants who had a bachelor's degree or higher (74%) had good knowledge, and only 26% had high school degrees or below. Whereas 68.6% held a bachelor's degree and above have poor knowledge, followed by 31.4% of participants having high school degrees and below.

Table 3: The association between hand surgery knowledge and sociodemographic characteristics

Factor	Participant with good knowledge	Participant poor knowledge	p -Value
Gender			0.597
Male	282 (40.8%)	316 (42.7%)	
Female	410 (59.2%)	424 (57.3%)	
Education level			0.115

Factor	Participant with good knowledge	Participant poor knowledge	p -Value
High school degree and below	180 (26%)	232(31.4%)	
Bachelor degree and above	512 (74%)	508 (68.6%)	

DISCUSSION

Both plastic and orthopaedic surgeons receive adequate training in hand surgery^{9,13,14}. Hand surgery involves the treatment of the hand from the tip to the shoulder⁸. During residency, exposure to the specialty begins and is followed by a 1 to 2 year fellowship in hand surgery, thus making them equally qualified to conduct hand surgery^{10,11}. In India, wrist surgery, brachial surgery, and microsurgery are included in the hand surgery training for fellows. Our study aim is to assess the public knowledge and awareness concerning hand surgery clinics. Our study found that the public believed an orthopedic surgeon was more qualified to perform hand surgery than a plastic surgeon (54.9%). Also, they have a perception that they felt safer in an orthopaedic surgeon's hands regarding complications and believed plastic surgeons could not perform hand surgery. Some of them, around 24.4%, had the assumption that all plastic surgeons could perform hand surgery. Half of the respondents had adequate knowledge of the capabilities of a plastic surgeon. At the same time, the rest believed that they could not, which is unexpected because just under this staggering finding indicates people's lack of knowledge regarding the qualifications of a plastic surgeon. An appropriate physician in terms of treating congenital hand anomalies is a plastic surgeon. However, 44.6% preferred an orthopaedic to treat it. This indicates that the public does not have sufficient awareness and information regarding such anomalies. When it comes to reconstruction, orthopaedics need to be specialized to perform hand surgery, and the public deemed a plastic surgeon the suitable physician for it. plastic surgeons, who do not need specialization due to their exposure during their residency. The majority (46.1%) believe that orthopaedic surgeons were only qualified to do hand surgery, whereas only 31.6% knew that not all orthopaedic surgeons were qualified to perform hand surgery. As far as the wrist joint replacement is concerned, the majority (77.2%) agreed that orthopaedic surgeons were the only ones capable of performing such a procedure. whereas the rest (13.7%) believed that

plastic surgeons could be followed by general surgeons (5.6%).

The 19.6% knew that there was no difference in both surgeons. Over one-third (37.7%) thought that the complication rate was lowered when orthopaedic surgeons performed the surgery. The majority did not have enough information to decide, while in the literature no evidence suggests that there is a difference between plastic and orthopaedic surgeons in terms of complication rates. In terms of overall knowledge, females seemed to understand both plastic and orthopaedic surgeons' capabilities and roles clearly and had a slight advantage over males, where they had answered more questions correctly. Respondents with a higher qualification or bachelor's degree had more knowledge and awareness about the topic than those with high school diplomas or lower.

Multiple factors contribute to the need for hand surgeons in India. Congenital anomalies due to consanguineous marriage, infections, tuberculosis manifestations of the hand, and/or are common presentations seen in clinical practice that require a hand surgeon to address and treat.⁷ This article tries to clarify the qualifications of a plastic surgeon, the favouritism people have toward an orthopaedic surgeon regarding hand surgery, and the public's misconceptions regarding it. Future research should focus on exploring people's biases concerning different specialties.

Study Limitations

One of the study's limitations was the source of information the patients received. If the authors did not ask about it, a higher response rate would be favorable to representing the Indian population accurately.

CONCLUSION

In the study found, we concluded that considerable gaps were seen in public understanding regarding the capabilities and competencies of plastic and orthopaedic surgeons in hand surgeries in India. Although both specialties are equipped to perform hand surgeries and undergo rigorous training, most respondents preferred orthopedic surgeons. It is evident that many individuals are not fully aware of the wide range of skills that plastic surgeons possess in effectively managing congenital hand anomalies and performing reconstructive procedures. The presence of bias can be attributed to the existence of misconceptions regarding the set of abilities possessed by plastic surgeons. The

results also showed that with women and those with bachelor's degrees there are demographic disparities in perception, or higher demonstrating a deeper comprehension. The significance of a thorough public education system needs improvement to improve the presence of these misconceptions while also prompting inquiries into the potential impact of these perceptions on patient decision-making and healthcare results. To explore the underlying factors contributing to these biases, further investigation is warranted, thereby enabling all people to make well-informed choices concerning their healthcare requirements.

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